General Specifications

Item	Specification
Lubricants and Sealants	
Multi-Purpose Grease D0AZ-19584-AA	ESB-M1C93-B
Threadlock and Sealer E0AZ-19554-AA	WSK-M2G351-A5
Clear Silicone Rubber D6AZ-19562-AA	ESB-M4G92-A
Pipe Sealant with Teflon® D8AZ-19554-A	ESR-M18P7-A
MERCON® Multi-Purpose ATF Transmission Fluid XT-2-QDX	Mercon®
Preload	
Output shaft preload	0.0127 mm (0.0005 in) - 0.1016 mm (0.004 in)
Synchronizer	
Synchronizer blocking ring to conical face runout	0.5 mm (0.02 in)
End Play	
Countershaft cluster gear end play	0.0254 mm (0.001 in) - 0.127 mm (0.005 in)
Output shaft end play	0.0127 mm (0.0005 in) - 0.1016 mm (0.004 in)

Torque Specifications

Description	Nm	lb-ft	lb-in
Bolt retaining gearshift lever to extension housing	18	13	—
Screw retaining inner shift boot to floor pan	10	—	89
Bolt retaining gear shift lever to gear shift stub shaft	37	27	—
Bolt retaining OSS to case	10	—	89
Bolt retaining countershaft rear bearing retainer to case	21	15	—
Shift lever reverse pin	40	30	—
Reversing lamp switch	37	27	—
Bolt retaining case cover to case	12	9	—
Bolt retaining extension housing to case	54	40	—
Bolt retaining input shaft bearing retainer to case	21	15	—
Drain plug	23	17	—
Bolt retaining transmission to block	75	55	—
Bolt retaining engine plate to transmission	27	20	—

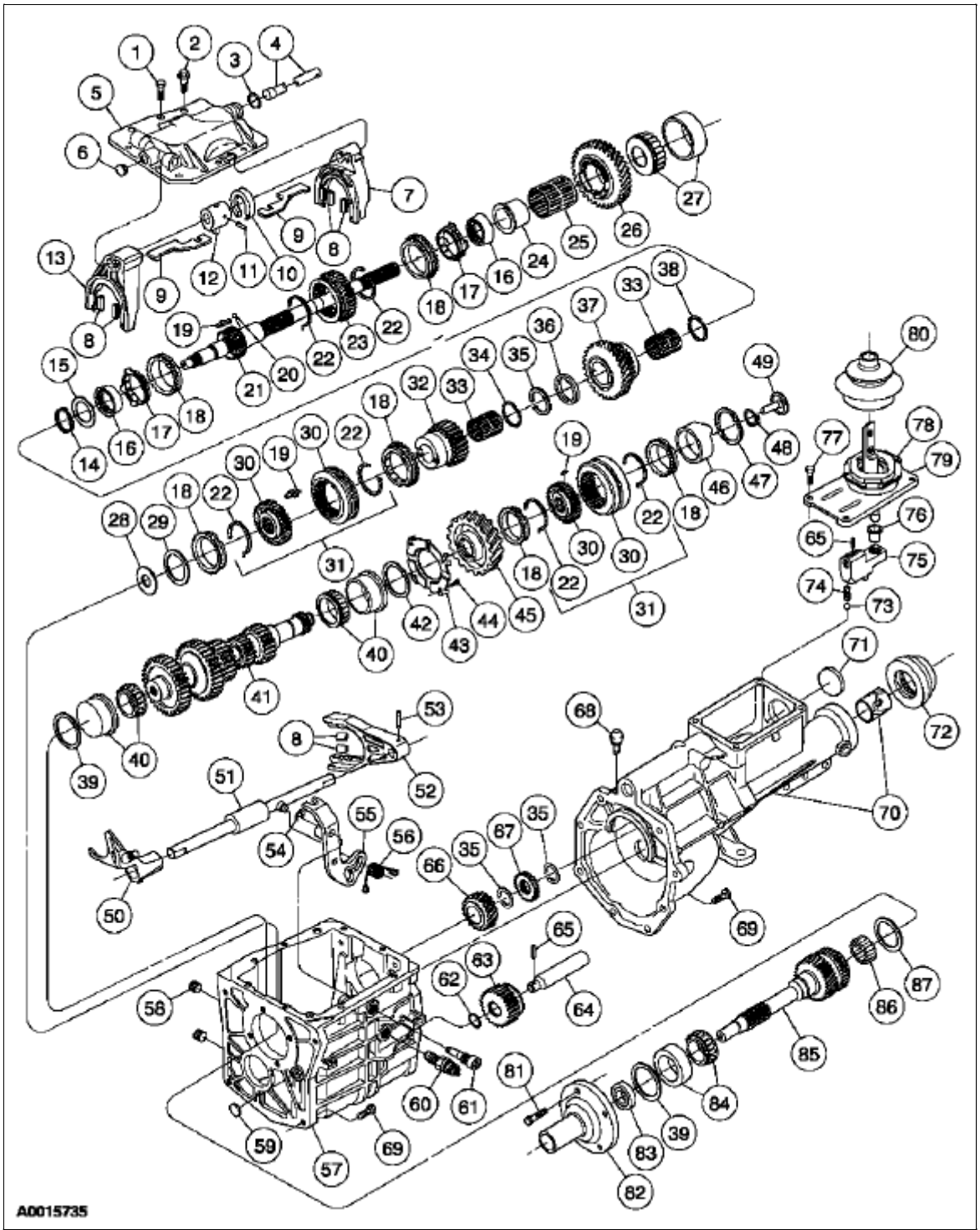
Bolt retaining crossmember to frame	41	30	—
Bolt retaining crossmember to transmission support	58	43	—
Nut retaining dual converter Y-pipe to exhaust manifold	40	30	—
Nut retaining dual converter Y-pipe flange to muffler	35	26	—
Bolt retaining driveshaft centering yoke to pinion flange	112	83	—

Manual Transmission

The T5OD 5-speed transmission:

- fifth speed gear functions as an overdrive gear.
- forward gears are synchronized and helical cut.
- shift interlock system prevents the engagement of more than one gear.

Transmission, Manual Five-Speed



Item	Part Number	Description
1	E602162-S71	Bolt
2	N800037-S2	Bolt
3	87038-S91	O-ring
4	7358	Main shift control shaft
5	7222	Case cover
6	74113-S	Plug
7	7230	Gear shifter fork 1-2 shift
8	7L082	Gear shift fork insert

9	7N232	Gear shift plate
10	7K201	Gear selector interlock sleeve
11	305078-S	Pin
12	7302	Selector body
13	7230	Gear shifter fork 3-4 shift
14	7160	Output shaft bearing snap ring
15	7117	Second speed synchronizer thrust washer
16	7175	First and second gear synchronizer inner cone
17	7174	First and second gear synchronizer outer cone
18	7107	Synchronizer blocking ring
19	7A044	Synchronizer hub insert (also part of 7124)
20	7K218	First and second speed synchronizer hub ball
21	7061	Output shaft assembly
22	7109	Synchronizer hub insert spring (also part of 7124)
23	7124	Sleeve (also part of 7061)
24	7173	First gear bearing spacer
25	7127	First gear bearing
26	7100	First gear
27	7065	Output shaft rear bearing
28	7D234	Thrust bearing
29	7D235	Thrust washer
30	—	Synchronizer hub (part of 7124)
31	7124	Synchronizer assembly
32	7B340	Third gear
33	7B369	Third speed bearing
34	7B320	Third speed gear bearing spacer
35	7064	Snap ring
36	7119	Thrust washer
37	7102	Second gear
38	7728	Second speed gear bearing spacer
39	7693	Countershaft front bearing seal
40	7F431	Countershaft bearing assembly
41	7113	Countershaft cluster gear
42	7L172	Countershaft rear bearing adjustment shim
43	7195	Countershaft rear bearing retainer
44	7C210	Bolt
45	7144	Fifth speed cluster gear
46	7M000	Reverse brake ring
47	7G042	Thrust washer
48	7059	Fifth speed synchronizer retaining snap ring
49	7L276	Oil pick-up funnel

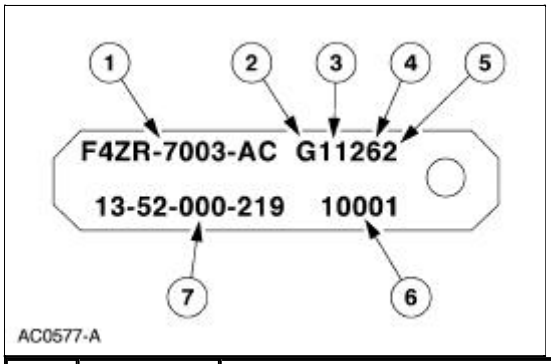
50	7230	Reverse shift fork
51	7240	Reverse gear shift rail
52	7230	Fifth gear shifter fork
53	357479-S15	Split pin
54	371197-S	Reverse gearshift lever retaining clip
55	7K002	Reverse gearshift lever
56	7E485	Reverse positioning spring
57	7005	Case
58	87675-S	Case plug
59	74113-S	Plug
60	15520	Reversing lamp switch
61	7K024	Shift lever reverse pin
62	7E397	Reverse gear overtravel stop
63	7141	Reverse idler gear and bushing
64	7140	Reverse idler gear shaft
65	357479-S15	Pin
66	7K316	Fifth speed driven gear
67	7H150	Output shaft speed wheel
68	7034	Vent
69	E800152-S72	Bolt
70	7A039	Extension housing
71	7K381	Extension plug
72	7052	Extension housing fluid seal
73	372720-S	Detent ball
74	7234	Shifter detent spring
75	7F018	Gearshift offset lever
76	7K453	Gearshift shaft bushing
77	7A443	Bolt
78	7C108	Gearshift lower boot clamp
79	7210	Gearshift lever
80	7277	Gearshift lever boot
81	N602187-S100	Bolt
82	7050	Input shaft bearing retainer
83	7052	Input shaft seal
84	7025	Input bearing assembly
85	7017	Input shaft
86	7118	Roller bearing (15 req'd)
87	7L357	Input shaft bearing spacer

Transmission Identification

The transmission identification tag is located under the lower left bolt that retains the extension

housing (7A039) to the case (7005).

Transmission Identification Tag



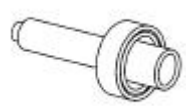
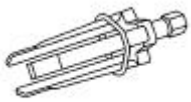
Item	Part Number	Description
1	—	Transmission assembly number
2	—	Build date code—month
3	—	Build date code—day
4	—	Build date code—year
5	—	Shift Number
6	—	Serial number
7	—	Wg. identification number (Located on the extension housing bolt on the LH side of the transmission)

Manual Transmission

Refer to Section 308-00 .

Seal

Special Tool(s)

 ST2199-A	Installer, Transmission Extension Housing Oil Seal 308-227 (T94P-7657-A)
ST1185-A	Slide Hammer 100-001 (T50T-100-A)
 ST2200-A	Remover, Bushing 307-001 (TOOL-1175-AC) or Equivalent

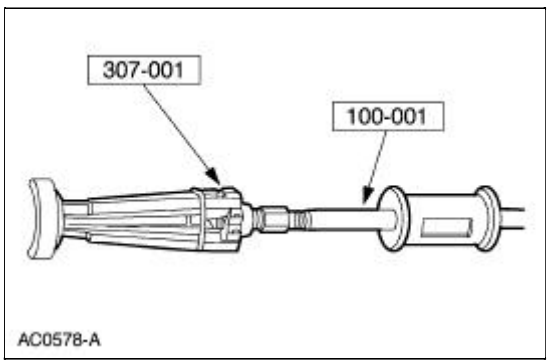
Removal

1. With the vehicle in NEUTRAL, raise and support the vehicle. For additional information, refer to Section 100-02 .

2. **CAUTION: Index-mark the driveshaft flange and pinion flange, and the driveshaft slip yoke and transmission output shaft.**

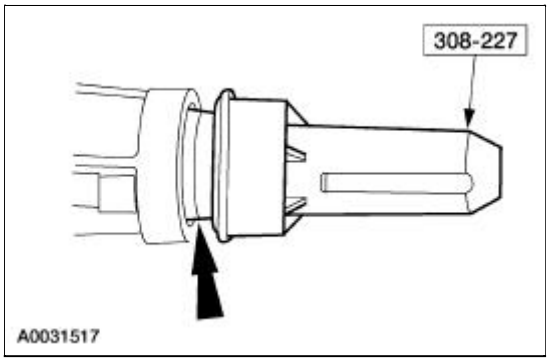
   Remove the driveshaft. For additional information, refer to Section 205-01 .

3. Using the special tools, remove the extension housing fluid seal.



Installation

1. Using the special tool, install the extension housing fluid seal.



2. **CAUTION: Align the index marks.**

   Install the driveshaft. For additional information, refer to Section 205-01 .

3. Check the transmission fluid level, add fluid if necessary.

4. Lower the vehicle.

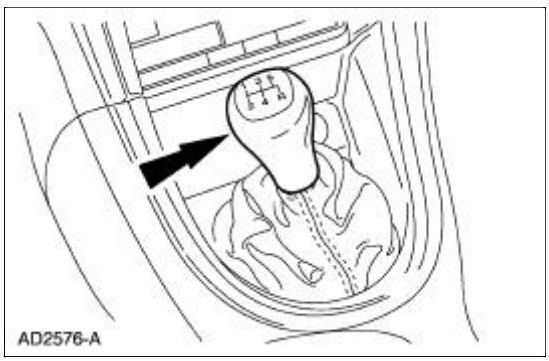
Gearshift Lever and Boot

Material

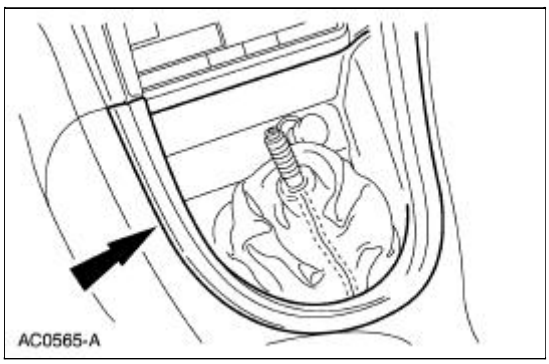
Item	Specification
Clear Silicone Rubber D6AZ-19562-AA or equivalent	ESB-M4G92-A

Removal and Installation

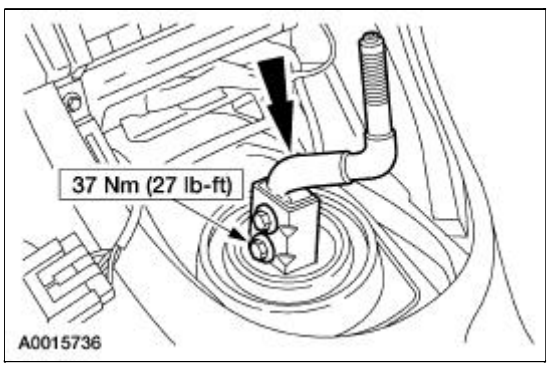
1. Remove the gearshift lever knob.



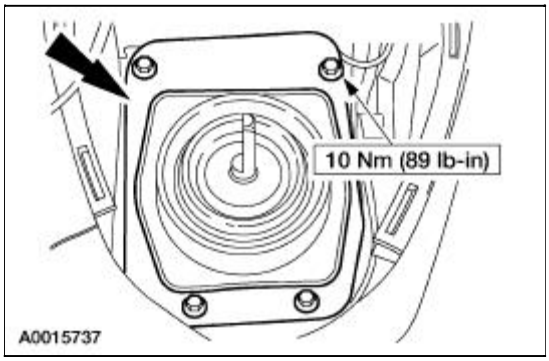
2. Remove the console panel gearshift plate. Lift the gearshift lever boot over the gearshift lever.



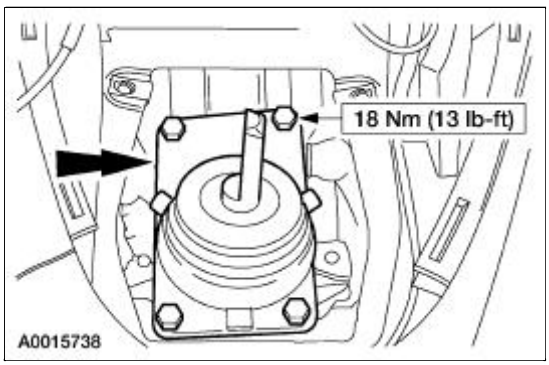
3. Remove the bolts and the shift lever.



4. Remove the screws and the inner shifter boot.



5. Remove the bolts and the gearshift lever.



6. Remove the gearshift lever boot.

7. **CAUTION: Cover the opening in the extension housing to prevent contamination.**

   Clean the gearshift lever mounting surfaces.

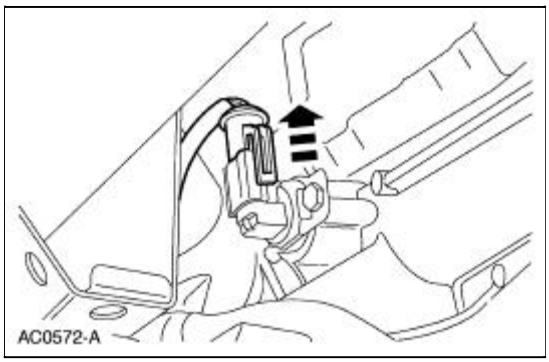
8. To install, reverse the removal procedure.
   - Apply a 3.2-mm (1/8-in) bead of silicone rubber to the sealing surface on the gearshift lever.

Output Shaft Speed (OSS) Sensor

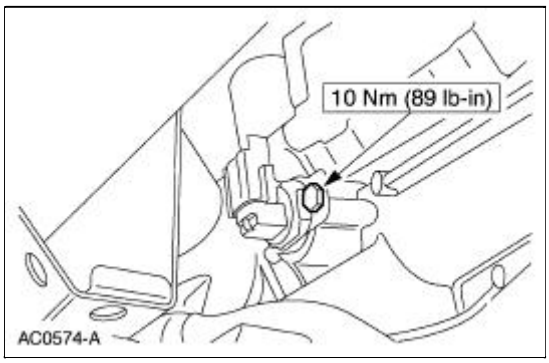
Removal and Installation

1. With the vehicle in NEUTRAL, raise and support the vehicle. For additional information, refer to Section 100-02 .

2. Disconnect the electrical connector.



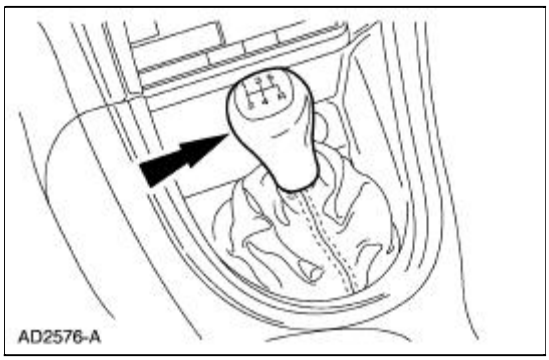
3. Remove the output shaft speed (OSS) sensor.



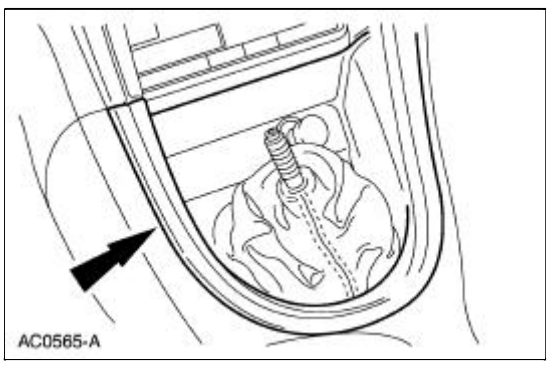
4. To install, reverse the removal procedure.

Transmission

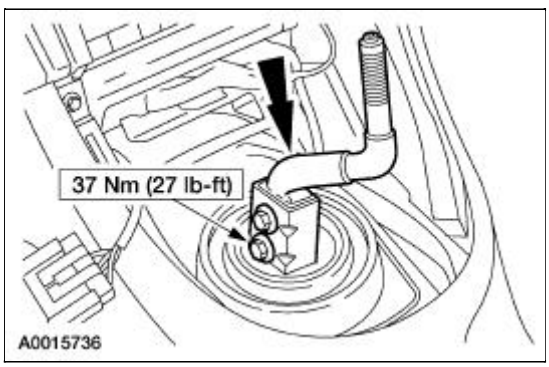
1. Disconnect the battery ground cable. For additional information, refer to Section 414-01 .
2. Lift up on the clutch pedal and secure it in place.
3. Remove the gearshift lever knob (7213).



4. Remove the console panel gearshift plate. Lift the gearshift lever boot over the gearshift lever (7210).

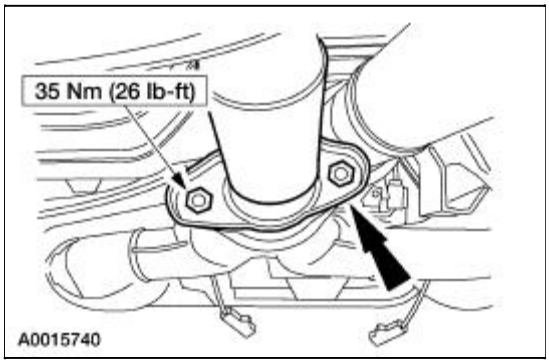


5. Remove the bolts and the shift lever.

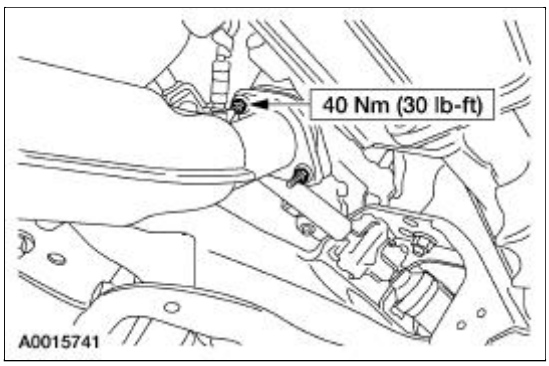


6. Raise and support the vehicle. For additional information, refer to Section 100-02 .
7. Disconnect the heated oxygen sensor electrical connectors.

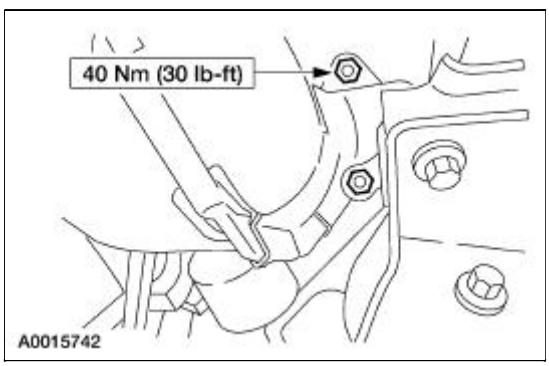
8. Remove the nuts. Position and secure the muffler and tailpipe out of the way.



9. Remove the LH nuts.



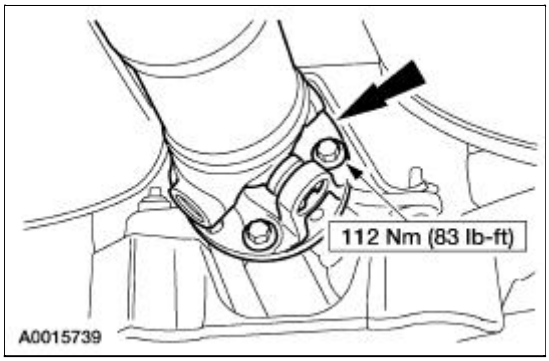
10. Remove the RH nuts.



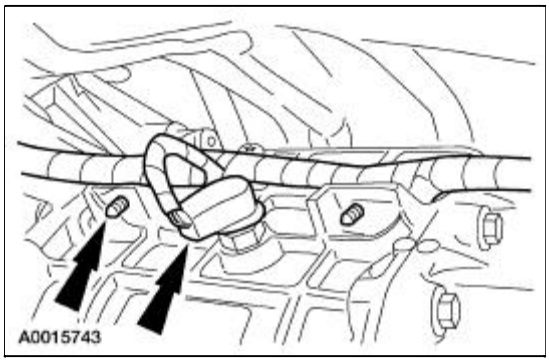
11. Remove the dual converter Y-pipe.

12. **CAUTION: Index-mark the driveshaft flange and pinion flange, and the driveshaft slip yoke and transmission output shaft.**

    Remove the driveshaft. For additional information, refer to Section 205-01 .

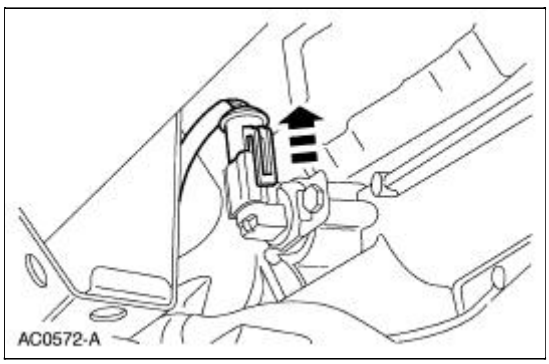


13. Disconnect the reversing lamp switch electrical connector. Disconnect the wiring harness from the transmission.

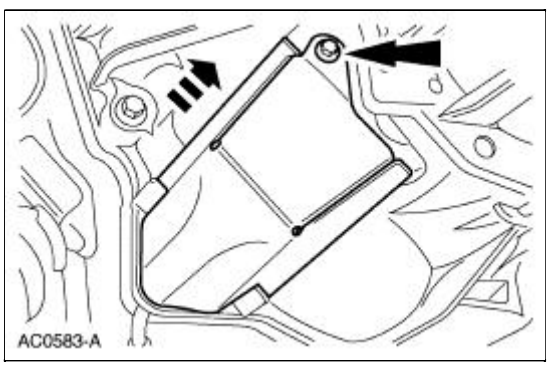


14. Remove the starter motor (11001). For additional information, refer to Section 303-06 .

15. Disconnect the output shaft speed sensor (OSS) electrical connector. Disconnect the wiring harness from the transmission.

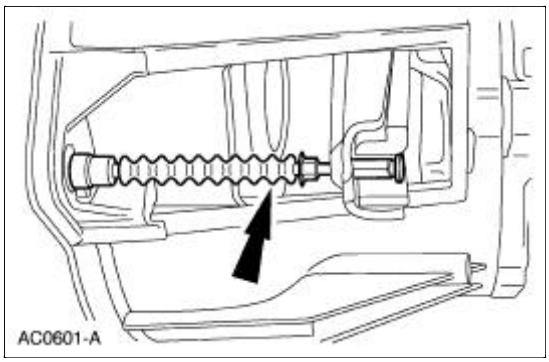


16. Remove the bolt and the clutch release lever cover.

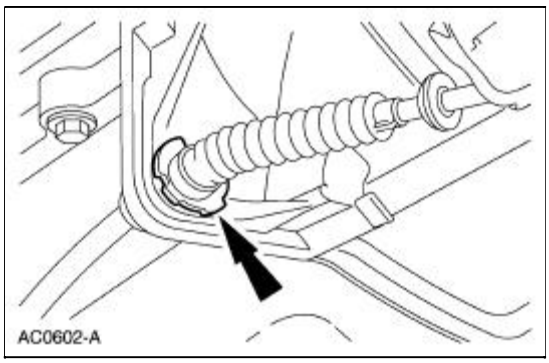


17. **CAUTION: To prevent damage, do not depress the clutch pedal with the transmission removed.**

    Disengage the clutch release cable from the clutch release fork.

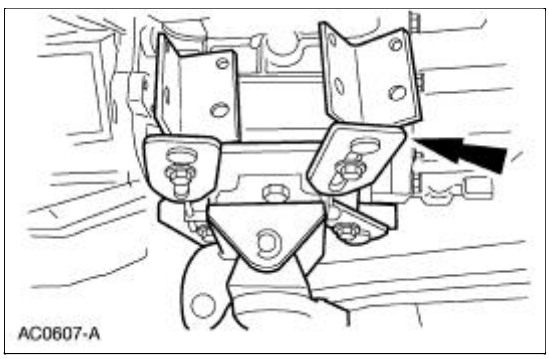


18. Remove the clutch cable retainer and remove the clutch cable from the transmission.

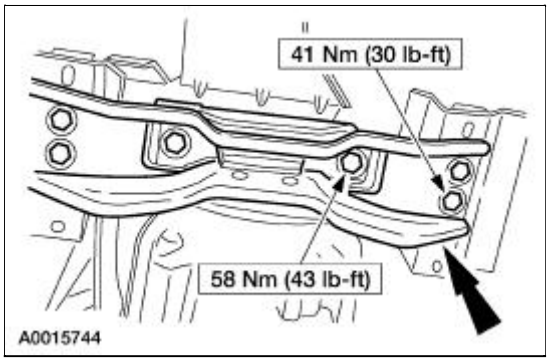


19. If transmission disassembly is necessary, drain the transmission fluid.

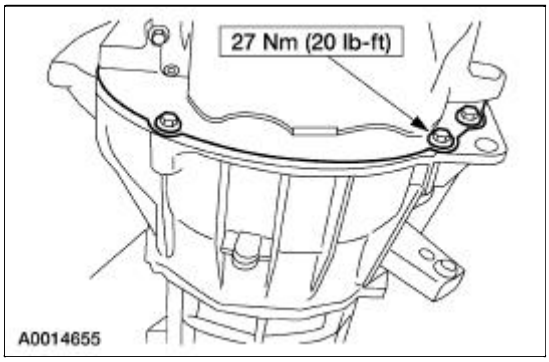
20. Position a transmission jack and support the transmission.



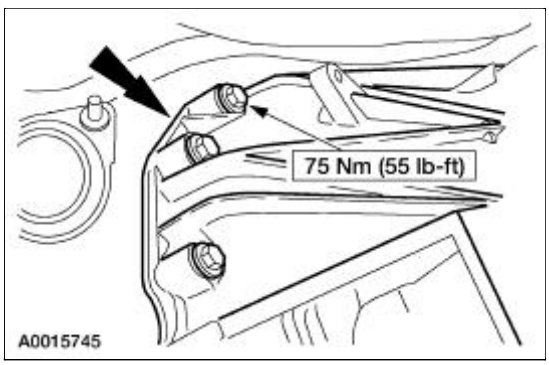
21. Remove the bolts and the transmission crossmember.



22. Remove the bolts.

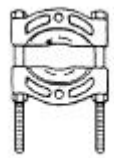
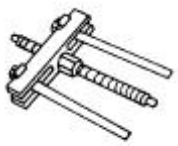
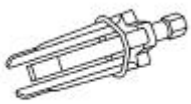


23. Lower the transmission and remove the five bolts.



Transmission

Special Tool(s)

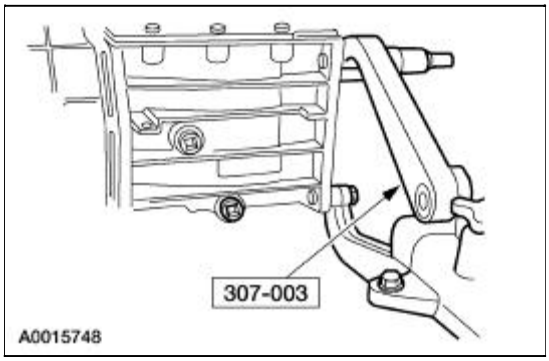
 ST1368-A	Bearing Puller 205-D064 (D84L-1123-A) or Equivalent
 ST1516-A	Front Hub Tool 204-069 (T81P-1104-C)
ST1186-A	Holding Fixture 307-003 (T57L-500-B)
ST1185-A	Impact Slide Hammer 100-001 (T50T-100-A)
 ST2200-A	Puller 307-001 (TOOL-1175-AC) or Equivalent
ST1302-A	Staking Punch 308-056 (T77J-7025-F)

1. Remove the clutch release hub and bearing and the clutch release lever. For additional information, refer to Section 308-01 .

2. **WARNING: Make sure protective eyewear is in place.**

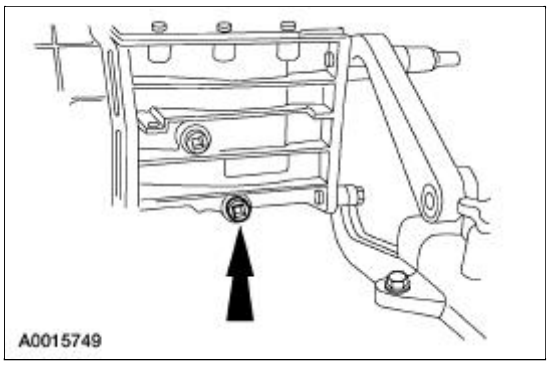
   Clean the transmission exterior with solvent and dry with compressed air. During disassembly, clean all components with solvent and dry with compressed air.

3. Attach the transmission to the special tool.



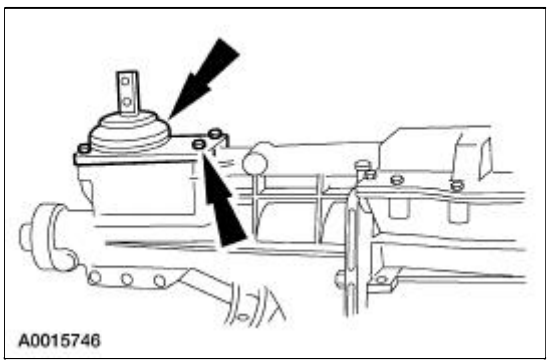
4. **NOTE:** Position a drain pan under the transmission.

   Remove the case plug.



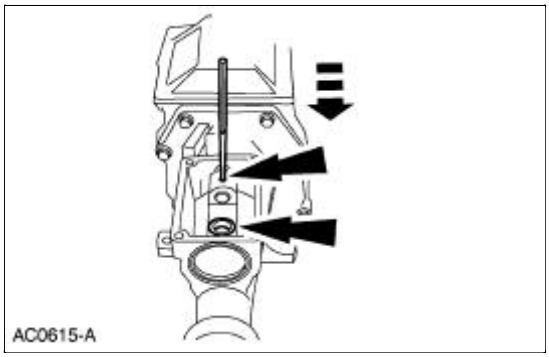
5. **NOTE:** Position the gearshift lever in NEUTRAL.

   Remove the bolts and the gearshift lever.

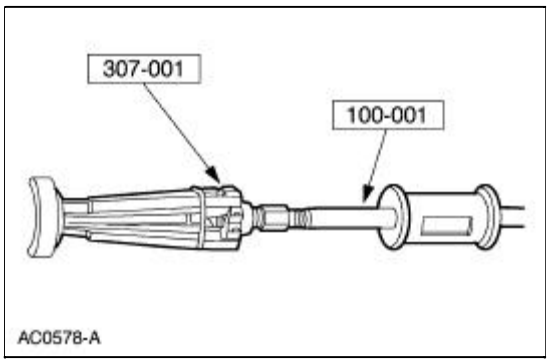


6. **CAUTION: Do not attempt to remove the gearshift offset lever with the extension housing bolted in place. A lug, located on the bottom of the gearshift offset lever, meshes with the detent plate preventing enough rearward movement of the gearshift offset lever to allow removal.**

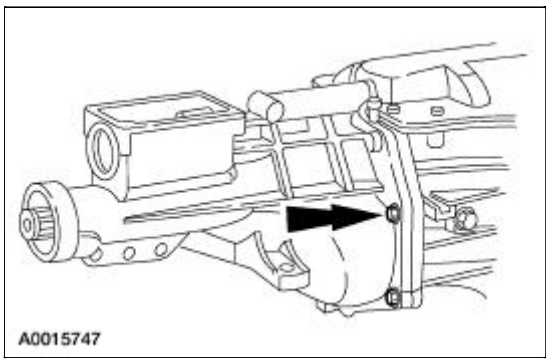
   Remove the split pin and the gearshift shaft bushing.



7. Using the special tools, remove the extension housing fluid seal.

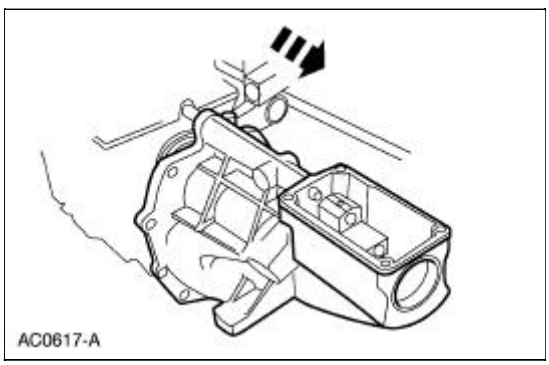


8. Remove the seven bolts and the identification tag.

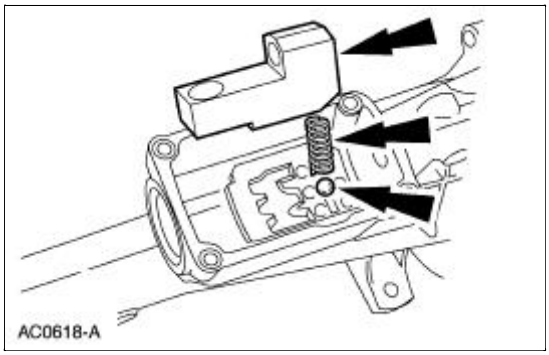


9. **CAUTION: The gearshift offset lever is under spring pressure.**

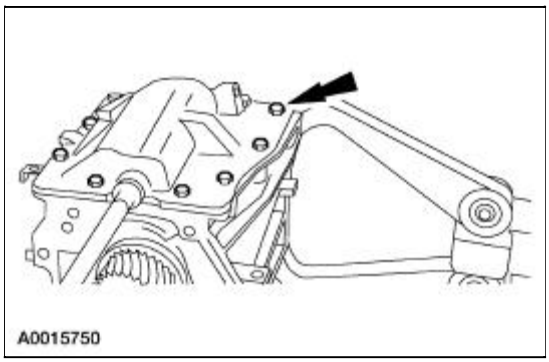
   While applying downward pressure on the gearshift offset lever, remove the extension housing and the gearshift offset lever as an assembly.



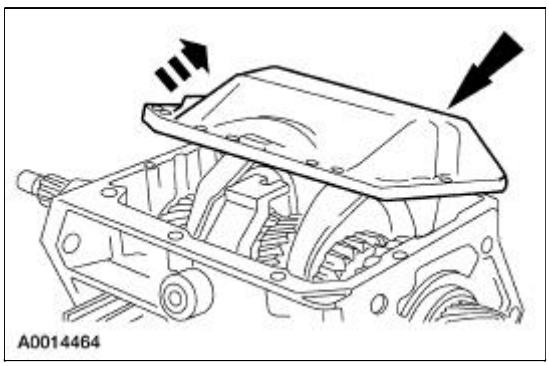
10. Remove the gearshift offset lever, the split pin, the shifter detent spring, and the detent ball.



11. Remove the bolts.

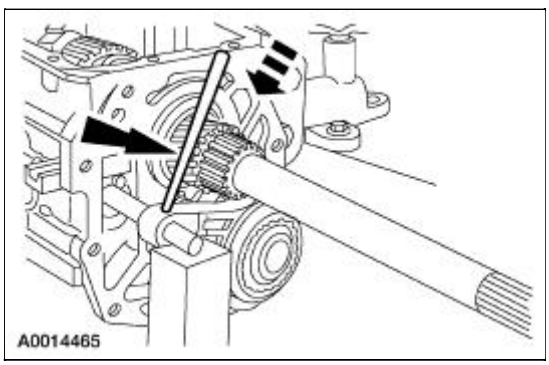


12. Remove the case cover.
    - Lift the case cover and slide it toward the filler plug side of the case to clear the reverse gearshift lever.

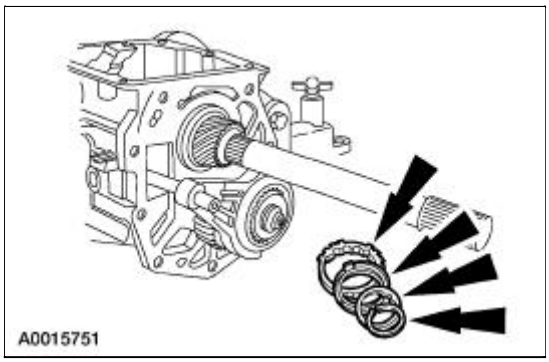


13. **CAUTION: Support the reverse gear shift rail (7240) with a block of wood.**

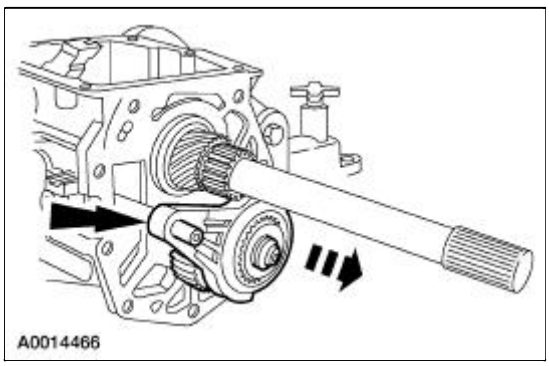
    Remove the split pin.



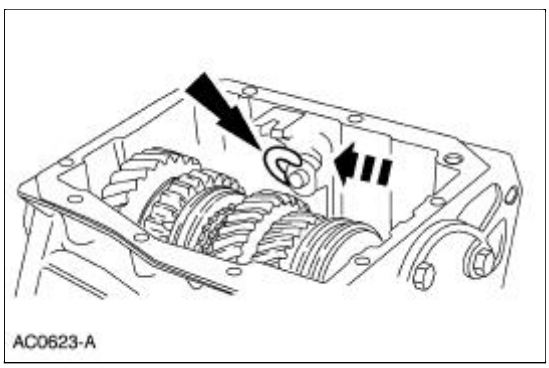
14. Remove the fifth speed synchronizer retaining snap ring, the thrust washer (7G042), the reverse brake ring (7M000), and the synchronizer blocking ring (7107).



15. Remove the fifth speed cluster gear (7144), the synchronizer blocking ring (7107), the synchronizer assembly (7124), and the fifth gear shifter fork (7230) as an assembly.

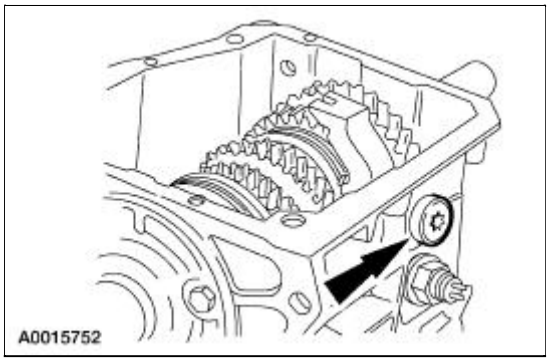


16. Remove the reverse gearshift lever retaining clip.

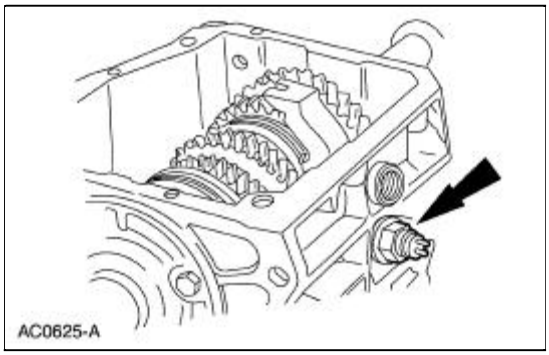


17. **NOTE:** Do not remove the reverse gearshift lever (7K002) at this time.

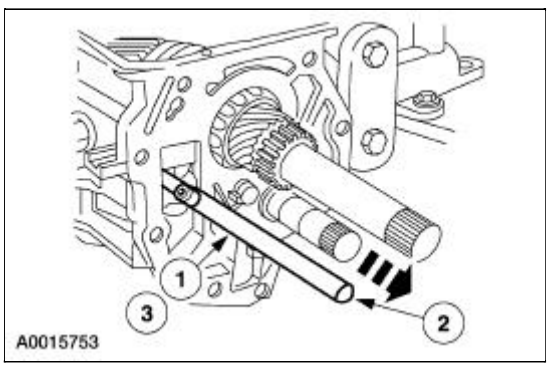
    Using a TORX® bit driver, remove the shift lever reverse pin (7K024).



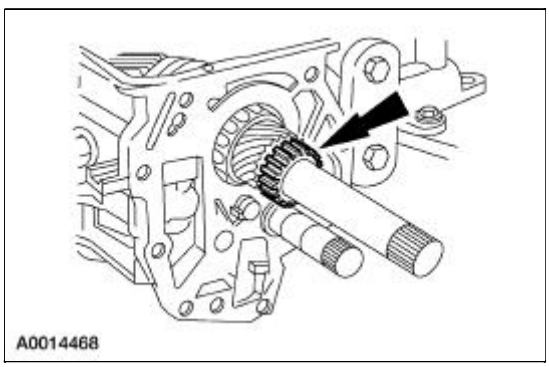
18. Remove the reversing lamp switch (15520).



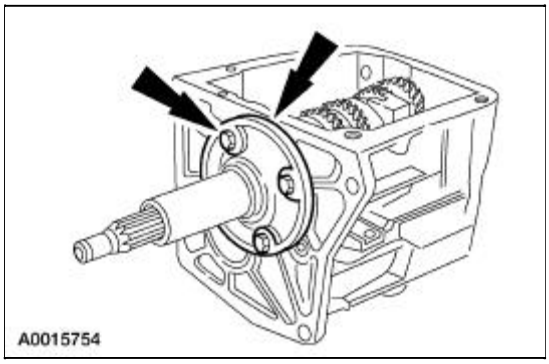
19. Remove the reverse gear shift rail.
    1. Rotate the reverse gear shift rail clockwise to disengage the ball stud from the reverse gearshift lever.
    2. Pull the reverse gear shift rail rearward slightly.
    3. Rotate the reverse gear shift rail counterclockwise to align the ball stud with the slot in the case and remove the reverse gear shift rail.



20. Remove the snap ring and the output shaft speed wheel (7H150).



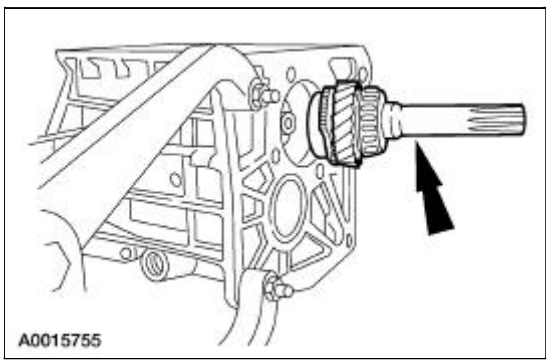
21. Remove the four bolts and the input shaft bearing retainer (7050).



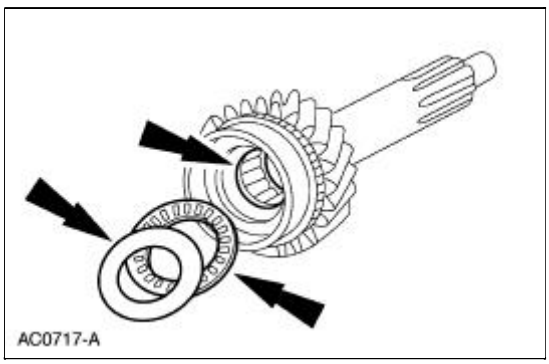
22. **CAUTION: Do not drop the 15 roller bearings (7118), the input shaft bearing spacer (7L357), the thrust bearing (7D234), and the thrust washer (7D235) from the rear of the input shaft (7017).**

    Remove the input shaft.

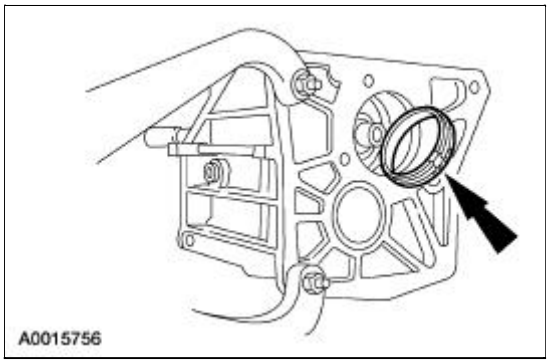
    - Rotate the input shaft until the flat on the fourth gear clutching teeth aligns with the countershaft cluster gear (7113).



23. Remove the thrust washer, the thrust bearing, the input shaft bearing spacer, and the 15 roller bearings.

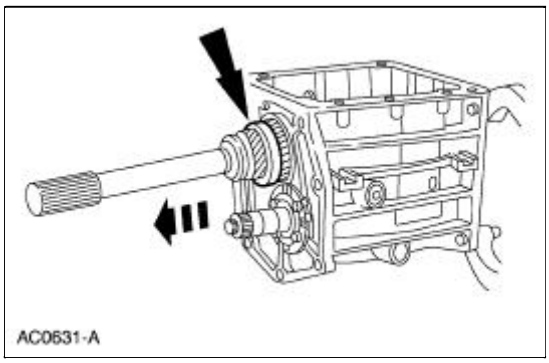


24. Remove the fourth speed synchronizer blocking ring (7107).

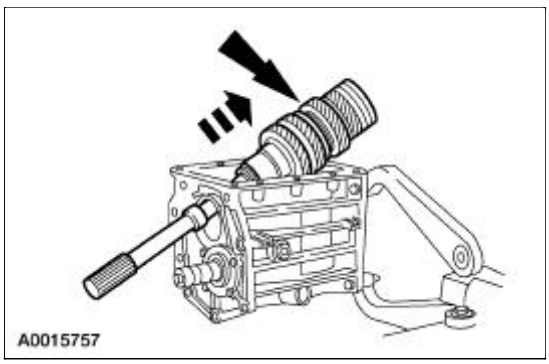


25. **NOTE:** If the output shaft rear bearing cup sticks, it is misaligned in the case bore. To free the output shaft rear bearing cup, work the output shaft assembly (7061) back and forth in the case (7005).

    Remove the output shaft rear bearing cup.



26. Remove the output shaft assembly.

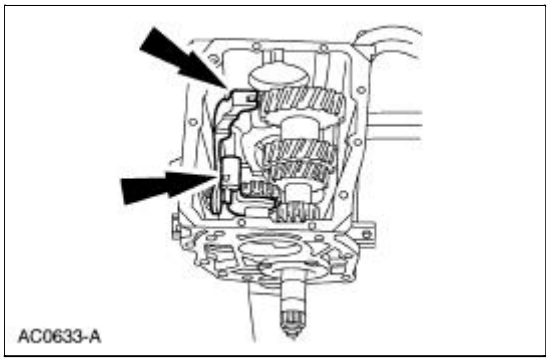


27. **NOTE:** Observe the location of the reverse gearshift lever, the reverse shift fork (7230), and the reverse positioning spring (7E485).

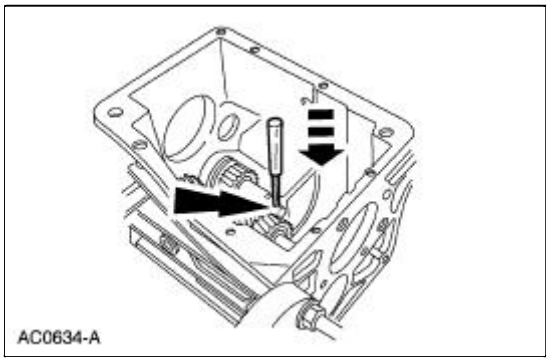
    NOTE: Observe the rotation action of the reverse positioning spring.

    Remove the reverse gearshift lever, the reverse shift fork, and the reverse positioning spring as an assembly.

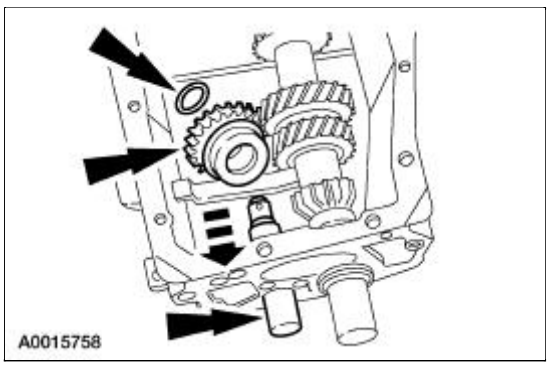
    - Hold the reverse gearshift lever and lift it upward as straight up as possible to remove the assembly.



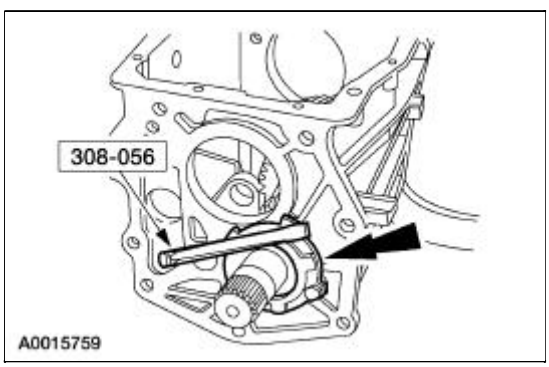
28. Remove the pin.



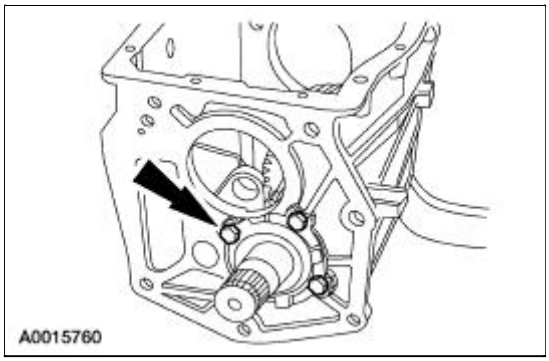
29. Remove the reverse idler gear shaft (7140), the reverse idler gear and bushing (7141), and the reverse gear overtravel stop (7E397).



30. Using the special tool, flatten the tabs on the countershaft rear bearing retainer (7195).

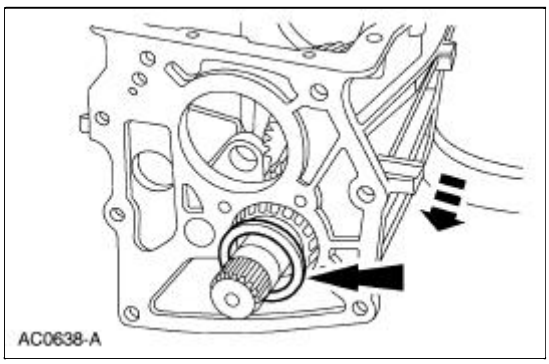


31. Remove the four bolts, the countershaft rear bearing retainer, and the shim (7L172).

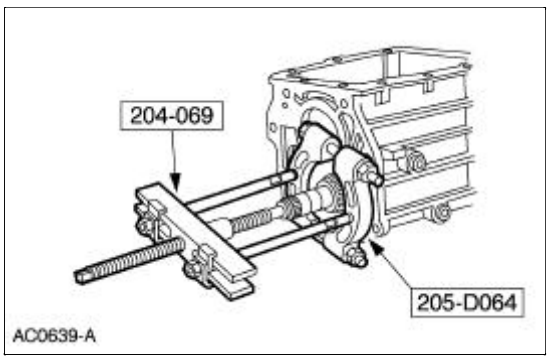


32. **NOTE:** If the bearing race sticks in the case, it is misaligned in the case bore. To free the race, work the countershaft cluster gear back and forth.

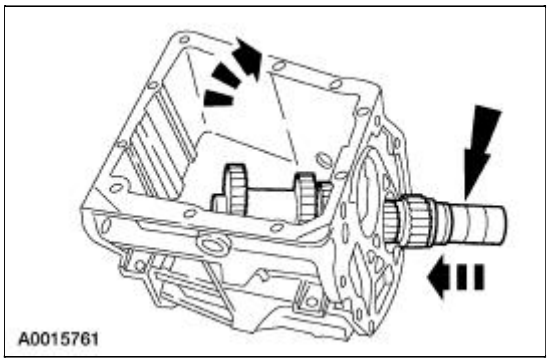
    Remove the bearing race.



33. Using the special tools, remove the rear countershaft bearing assembly (7F431).



34. Move the countershaft cluster gear rearward through the bearing bore. Tilt the assembly upward and remove it from the case.

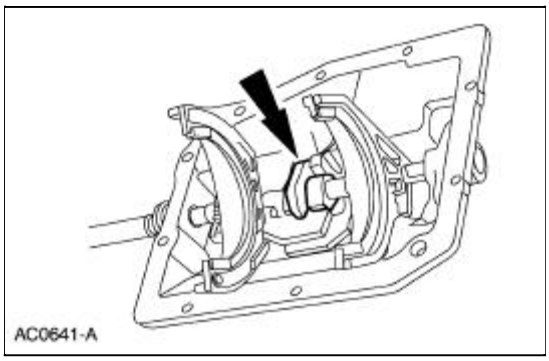


Selector Plate

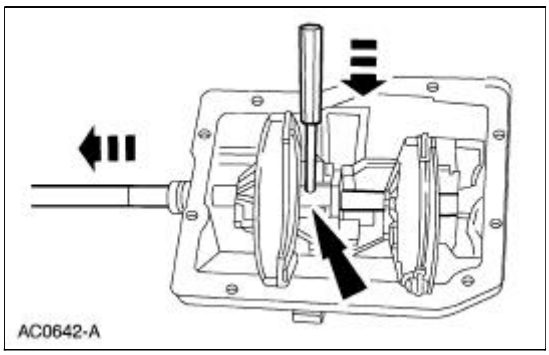
Disassembly

1. **NOTE:** Mark the position of each gear shifter fork (7230).

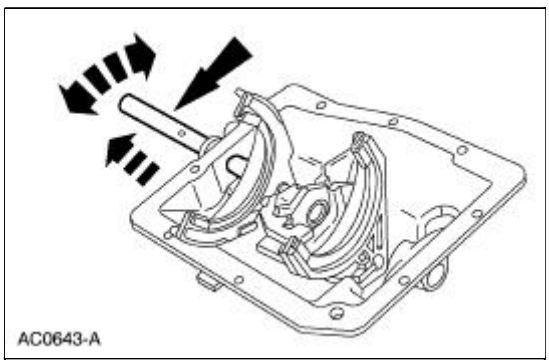
   Place the gear shift plates (7N232) and the gear selector interlock sleeve (7K201) in the neutral position to center the gear shift plates and the selector body (7302).



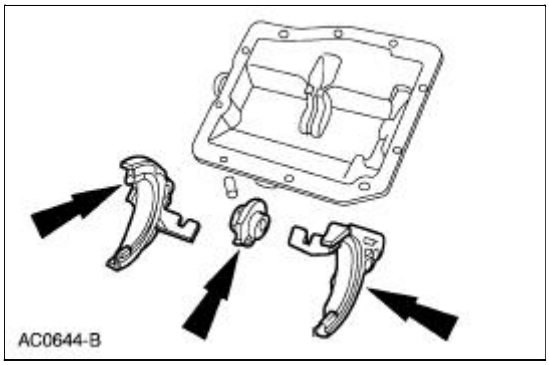
2. Rotate the main shift control shaft (7358) counterclockwise and pull it rearward to access the pin. Remove the pin.



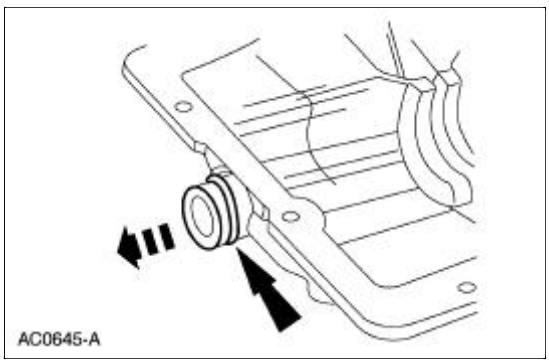
3. Using a twisting motion, remove the main shift control shaft.



4. Remove the gear shifter forks, the gear shift plates, the pin, the gear selector interlock sleeve, and the selector body.

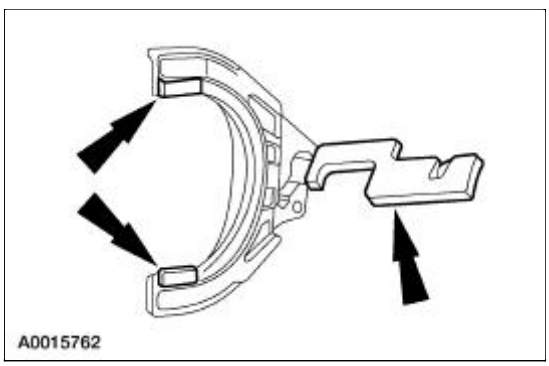


5. Remove the O-ring (N800037-S2).



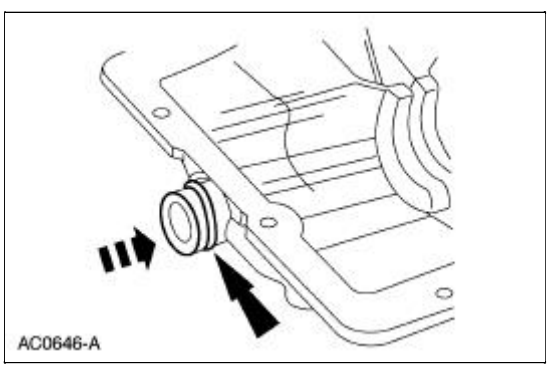
6. **CAUTION: Note the orientation of the gear shift plate for assembly reference.**

   Remove the gear shift plate and the gear shift fork inserts (7L082) from the shifter forks.

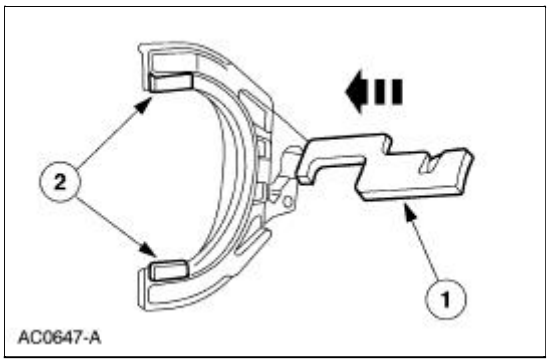


Assembly

1. Install the new O-ring.

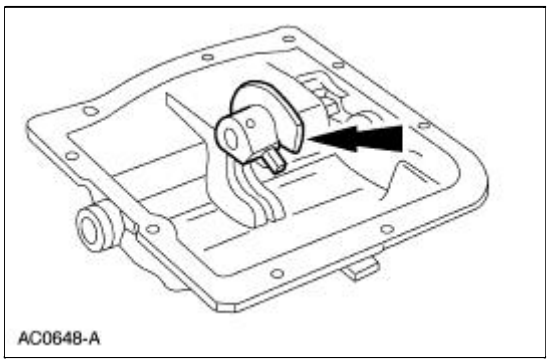


2. Assemble the gear shifter forks.
    1. Install the gear shift plate into the gear shifter fork.
    2. Install the gear shift fork inserts.



3. **NOTE:** Position the narrow side of the C-shaped gear selector interlock sleeve in the case cover slot. Position the roll pin hole in the selector body toward the rear of the cover.

    Install the gear selector interlock sleeve and the selector body as an assembly.

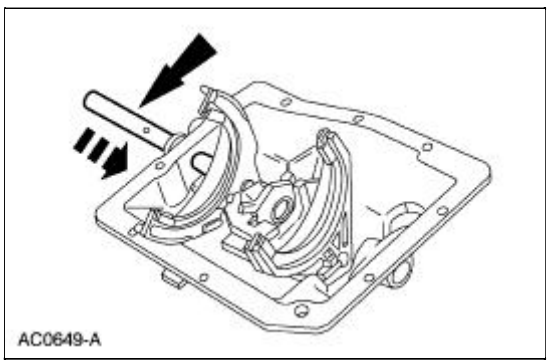


4. Lubricate the main shift control shaft with petroleum jelly.

5. **NOTE:** The 1-2 gear shifter fork is the larger shifter fork. The gear shifter fork offset lever must face the cover. Position the gear shift plate attached to the 3-4 gear shifter fork under the gear shift plate attached to the 1-2 gear shifter fork.

    Position the gear shifter forks and the main shift control shaft in the cover.

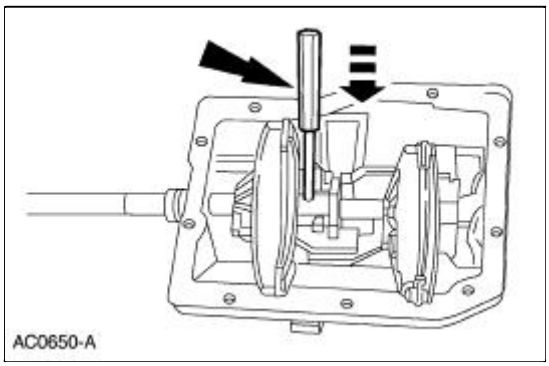
    - Slide the shaft through the cover and shift the components until the shaft stops against the cover.



6. **CAUTION: Install the pin slightly below the selector body surface. Failure to countersink the pin may result in interference between the pin and the gear selector interlock sleeve during shifts.**

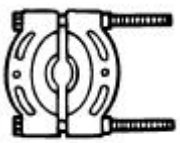
NOTE: The flat on the main shift control shaft must face upward.

Install the pin.



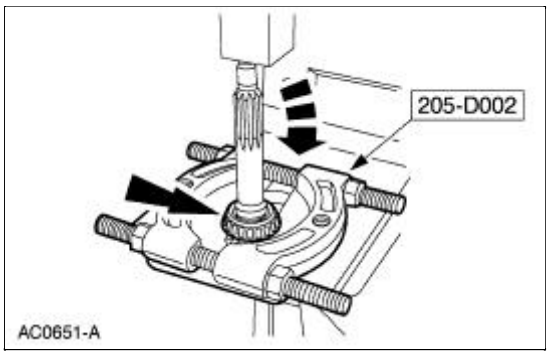
Input Shaft and Bearing

Special Tool(s)

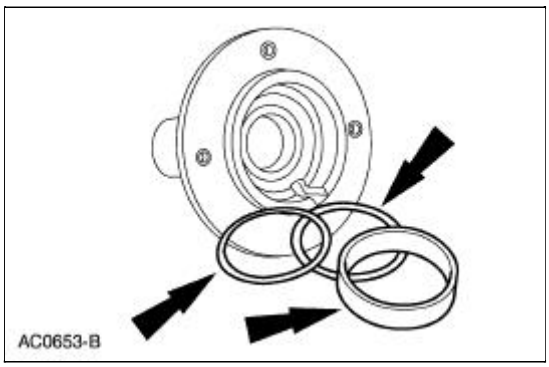
ST2355-A	Input Shaft Seal Replacer 308-220 (T94P-7025-AH)
 ST1895-A	Pinion Bearing Cone Remover 205-D002 (D79L-4621-A) or Equivalent

Disassembly

1. Using the special tool and a press, remove the input bearing (7025).



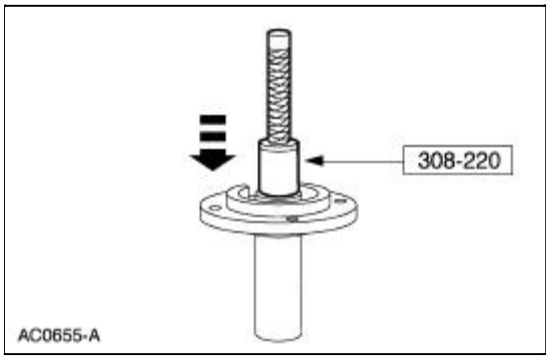
2. Remove the bearing race and the end play selective shims.



3. Remove the input shaft seal (7052).

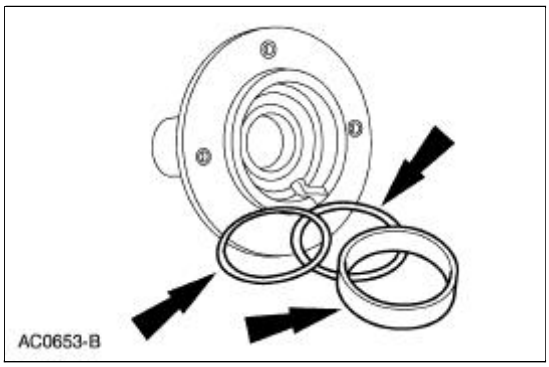
Assembly

1. Using the special tool, install the input shaft seal.

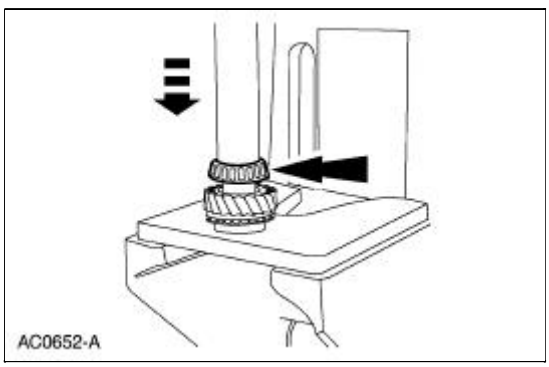


2. **NOTE:** In installing a new input shaft seal as part of a transmission overhaul, do not install the end play selective shims at this time.

   Instal the end play selective shims and the bearing race.

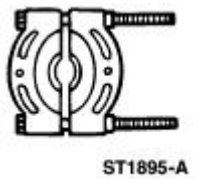


3. Using a press and a capped length of pipe, install the input bearing.



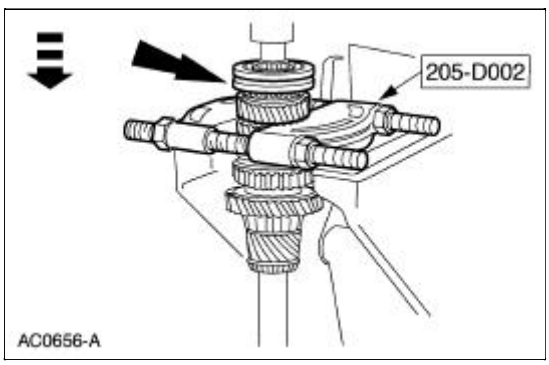
Output Shaft

Special Tool(s)

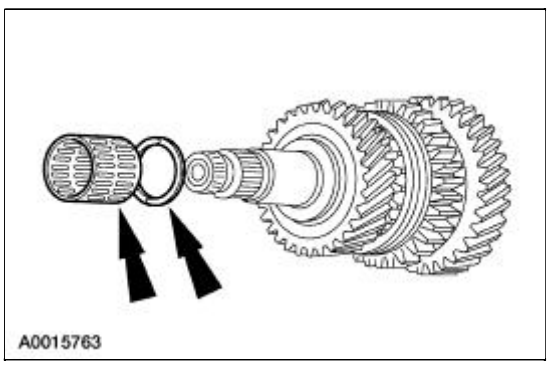
 ST1895-A	Pinion Bearing Cone Remove 205-D002 (D79L-4621-A) or Equivalent
ST2406-A	Spiral Snap Ring Replacer 308-096 (T85P-7025-A)

Disassembly

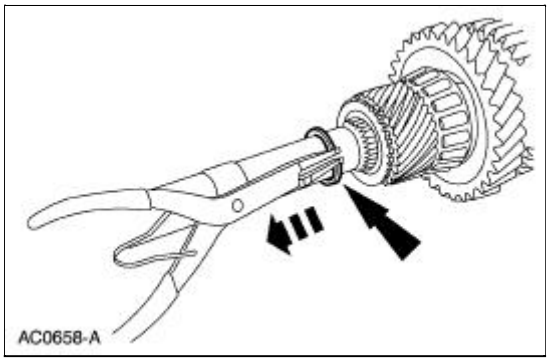
1. Using the special tool and a press, remove the third/fourth gear synchronizer assembly (7124), the third speed synchronizer blocking ring (7107), and the third gear (7B340) as an assembly.



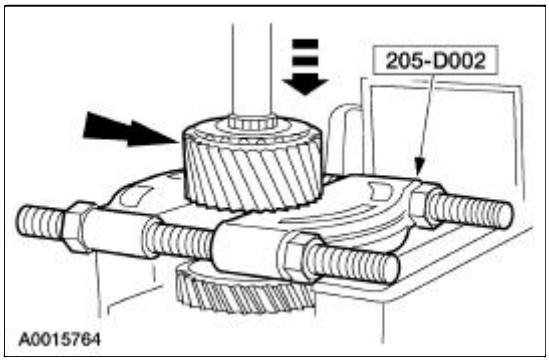
2. Remove the third speed bearing (7B369) and the third speed gear bearing spacer (7B320).



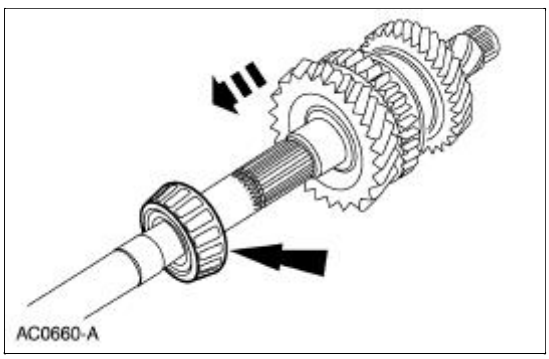
3. Remove the snap ring.



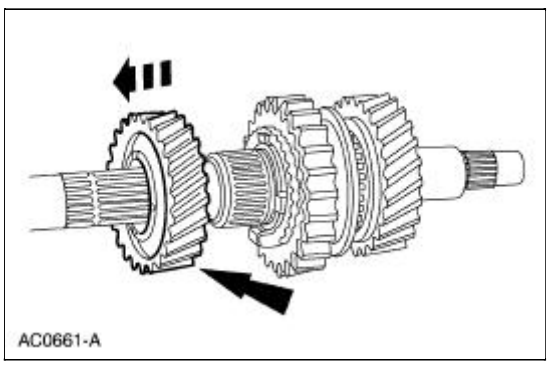
4. Using the special tool and a press, remove the fifth speed driven gear (7K316).



5. Remove the output shaft rear bearing (7065).

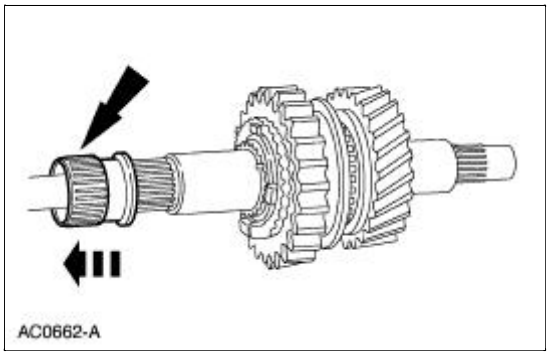


6. Remove the first gear (7100).

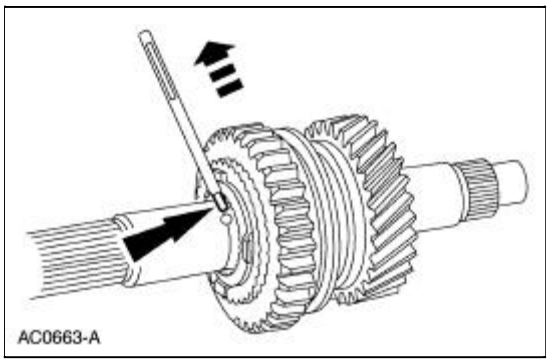


7. **NOTE:** The first gear bearing spacer (7173) fits snugly on the output shaft assembly (7061).

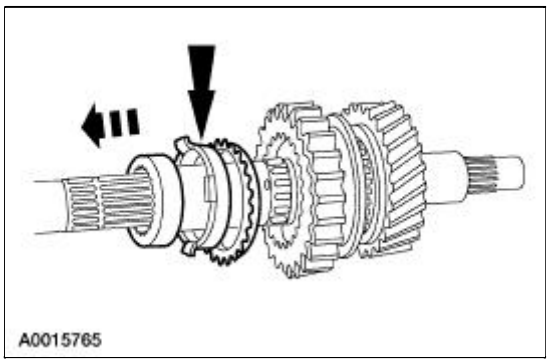
   Remove the first gear bearing (7127) and the spacer as an assembly.



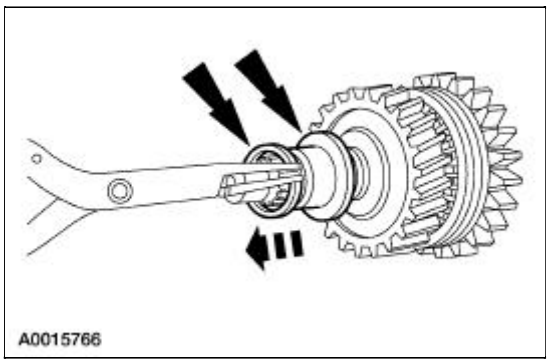
8. Remove the first and second speed synchronizer hub ball (7K218).



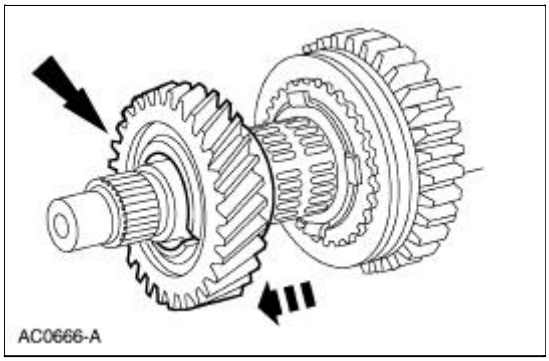
9. Remove the first speed synchronizer inner cone (7175), the first speed synchronizer outer cone (7174), and the first speed synchronizer blocking ring (7107) as an assembly.



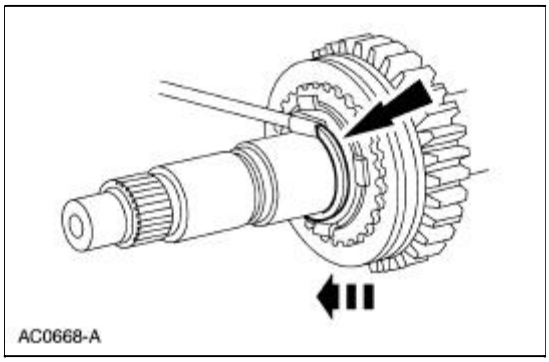
10. Remove the snap ring and the thrust washer (7119).



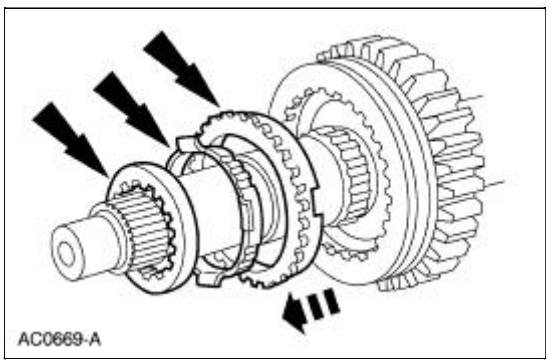
11. Remove the second gear (7102), the second speed bearing (7B369), and the second speed gear bearing spacer (7728).



12. Remove the output shaft bearing snap ring and the second speed synchronizer thrust washer (7117).



13. Remove the second speed synchronizer inner cone (7175), the second speed synchronizer outer cone (7174), and the second speed synchronizer blocking ring (7107) as an assembly.

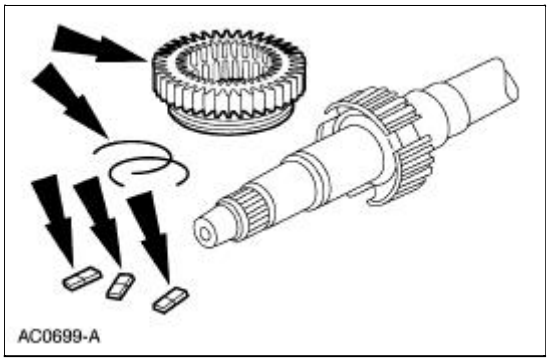


14. Remove the first and second gear synchronizer sliding sleeve (7124).

15. **CAUTION: Note the orientation of the synchronizer hub insert springs (7109) and the synchronizer hub inserts (7A044) for assembly reference.**

    NOTE: The first and second gear synchronizer sliding sleeve, the hub, and the output shaft are an assembly. Do not attempt to separate the hub from the output shaft. Only the synchronizer hub insert springs and the synchronizer hub inserts are available separately.

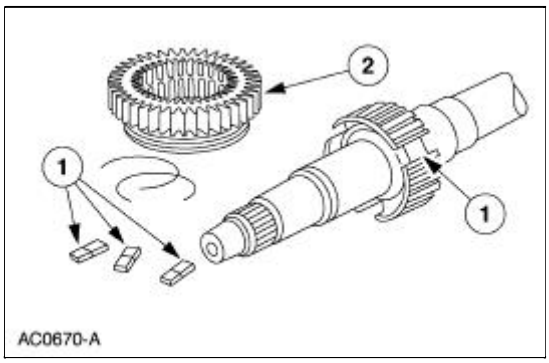
    Remove the synchronizer hub insert springs and the hub inserts.



Assembly

1. Soak the blocking rings in transmission fluid for ten minutes.
    - Use MERCON® Multi-Purpose ATF Transmission Fluid XT-2-QDX or equivalent.

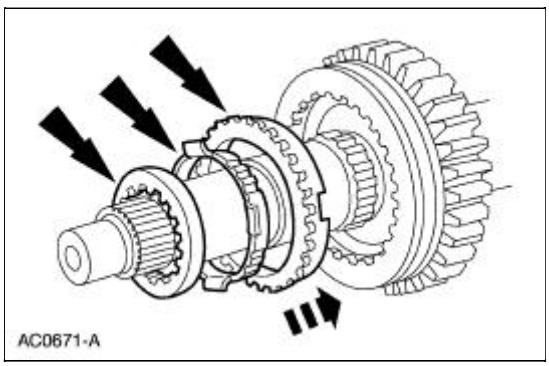
2. Assemble the first and second synchronizer.
    1. Install the synchronizer hub insert springs and the synchronizer inserts into the synchronizer hub.
    2. Install the sliding sleeve onto the hub.



3. **NOTE:** If not done so previously, soak the blocking ring in MERCON® Multi-Purpose ATF Transmission Fluid XT-2-QDX or equivalent for ten minutes.

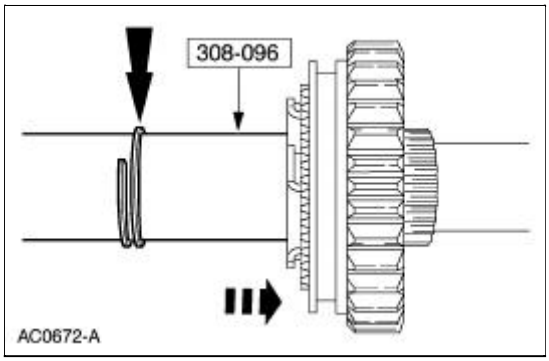
   NOTE: Align the slots in the synchronizer blocking ring with the tabs in the first and second speed synchronizer.

   Install the second speed synchronizer blocking ring and the inner and outer cones as an assembly.

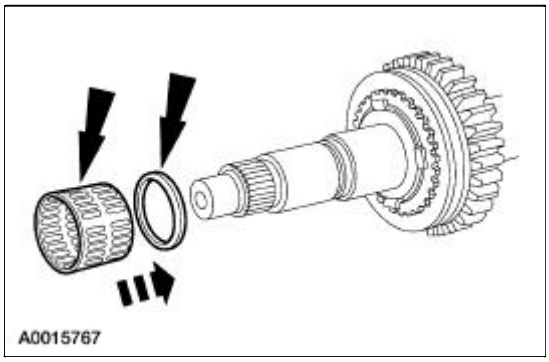


4. Install the second speed synchronizer thrust washer.

5. Using the special tool, install the output shaft bearing snap ring.

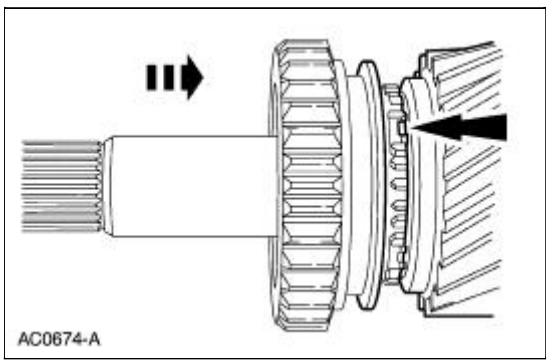


6. Install the second speed gear bearing spacer and the second speed bearing.

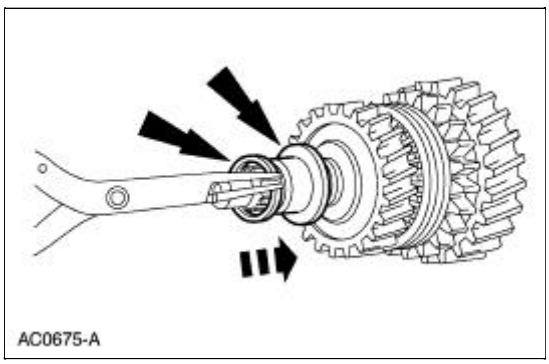


7. **NOTE:** Align the slots in the second gear with the tabs on the synchronizer blocking ring.

   Install the second gear onto the output shaft.



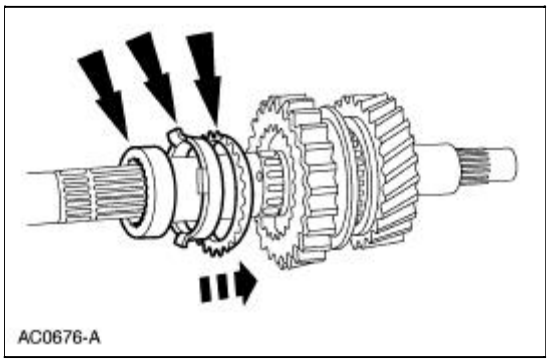
8. Install the thrust washer and the snap ring.



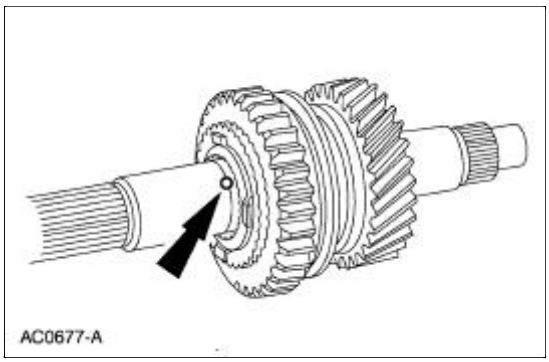
9. **NOTE:** If not done so previously, soak the blocking ring in MERCON® Multi-Purpose ATF Transmission Fluid XT-2-QDX or equivalent for ten minutes.

NOTE: Align the slot in the synchronizer blocking ring with the tab on the first and second synchronizer.

Install the first speed synchronizer blocking ring and the inner and outer cones as an assembly.

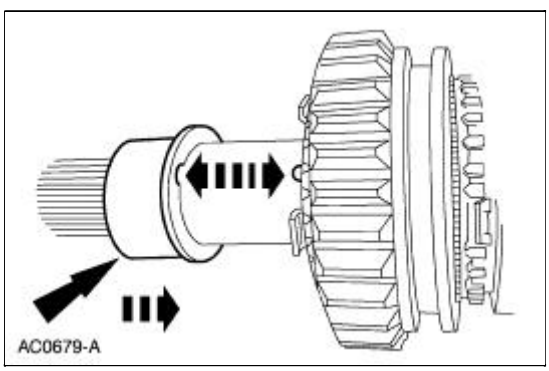


10. Install the first and second speed synchronizer hub ball.



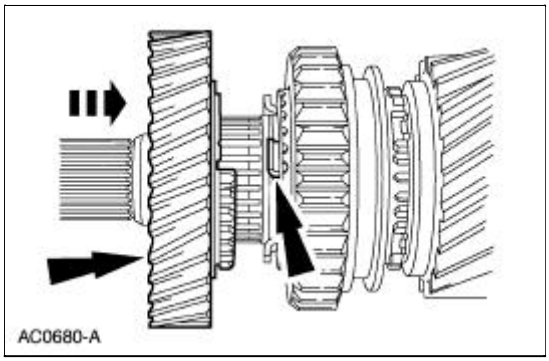
11. **NOTE:** Align the notch in the first gear bearing spacer with the first and second speed synchronizer ball.

    Install the first gear bearing spacer and the first gear bearing.

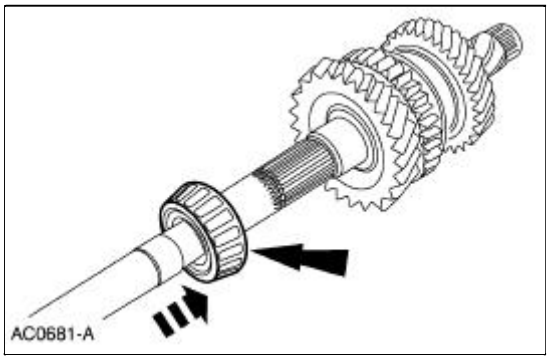


12. **NOTE:** Align the slots on the synchronizer blocking ring with the slots on the first gear.

    Install the first gear.



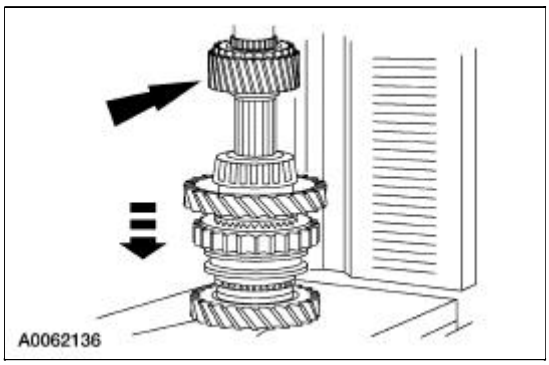
13. Install the output shaft rear bearing.



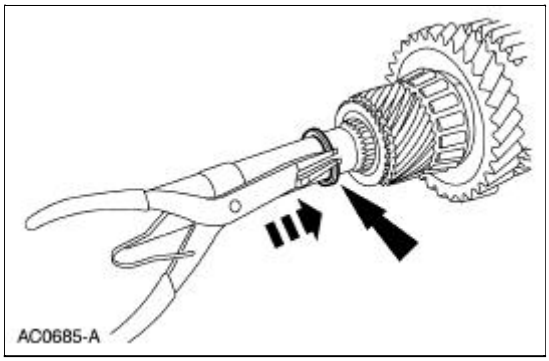
14. Lubricate the splines of the fifth speed driven gear with petroleum jelly.

15. **CAUTION: Align the output shaft splines and the splines of the fifth speed driven gear or damage will occur.**

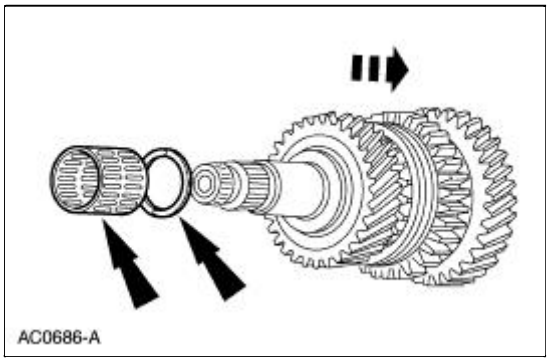
    Position the fifth speed driven gear on the output shaft. Using a press and a capped length of pipe 31.7 mm (1.26 in) inside diameter X 356 mm (14.24 in) long, install the fifth speed driven gear.



16. Install the snap ring.



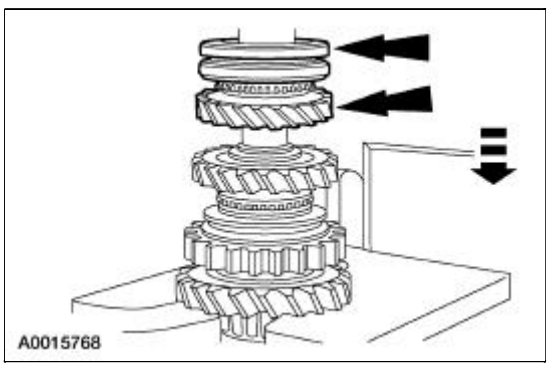
17. Install the third speed gear bearing spacer and the third speed bearing.



18. **CAUTION: Before pressing the components together, verify that the synchronizer hub faces the short end of the output shaft. Hold the third gear against the synchronizer to maintain the synchronizer blocking ring alignment.**

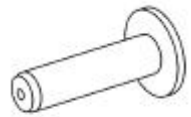
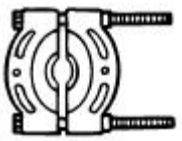
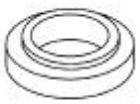
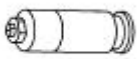
NOTE: If not done so previously, soak the blocking ring in MERCON® Multi-Purpose ATF Transmission Fluid XT-2-QDX or equivalent for ten minutes.

Using a 1-1/2 inch deep well socket and a press, install the third gear, the third speed synchronizer blocking ring, and the third/fourth gear synchronizer assembly.



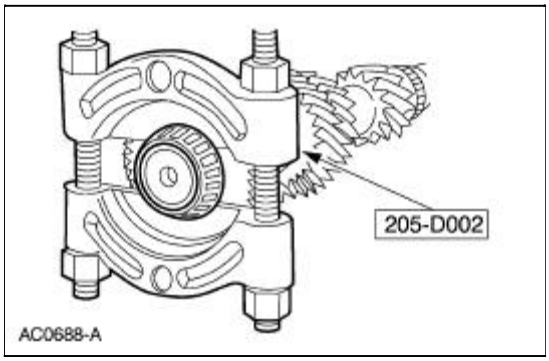
Countershaft Bearing

Special Tool(s)

ST2356-A	Bearing Replacer 308-061 (T77J-7025-L)
 ST2358-A	Front Bearing Replacer 308-062 (T77J-7025-M)
ST2357-A	Mainshaft Front Bearing Replacer 308-081 (T82T-7003-DH)
 ST1895-A	Pinion Bearing Cone Remover 205-D002 (D79L-4621-A) or Equivalent
 ST2359-A	Pinion Bearing Cone Replacer 205-011 (T57L-4621-B)
ST1303-A	Remover and Replacer Tube 308-024 (T75L-7025-B)
 ST2147-A	Remover and Replacer Tube 308-052 (T77J-7025-B)

Disassembly

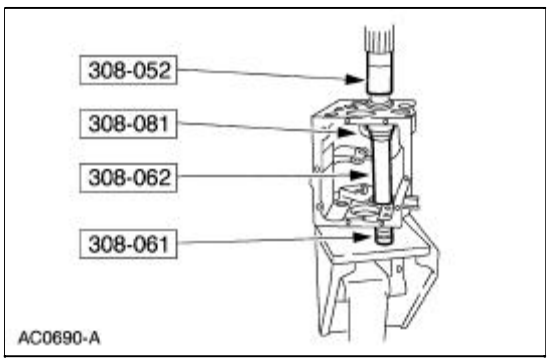
1. Using the special tool and a press, remove the countershaft bearing assembly (7F431).



2. **CAUTION: Failure to correctly support the case (7005) during bearing race removal will result in permanent distortion of the case.**

   NOTE: Remove the front countershaft bearing race only if damaged or worn.

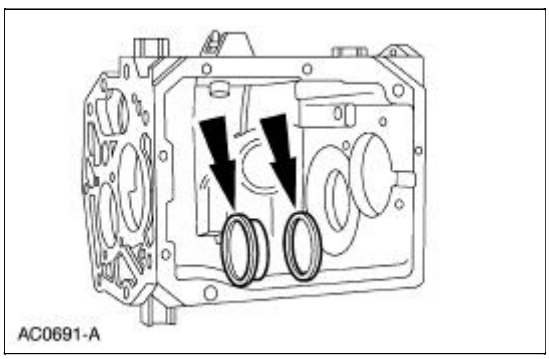
   Using the special tools and a press, remove the bearing race and the countershaft front bearing seal (7693).



Assembly

NOTE: Position the countershaft in the transmission case before installing the rear countershaft bearing.

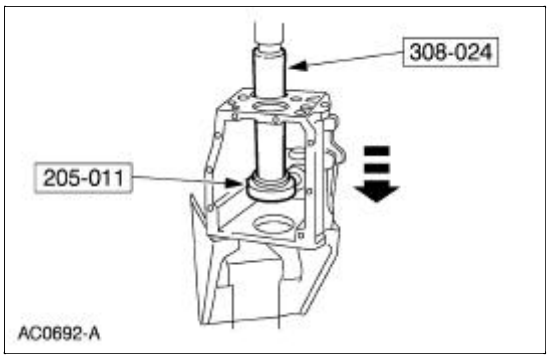
1. Install the countershaft front bearing seal on the bearing race.



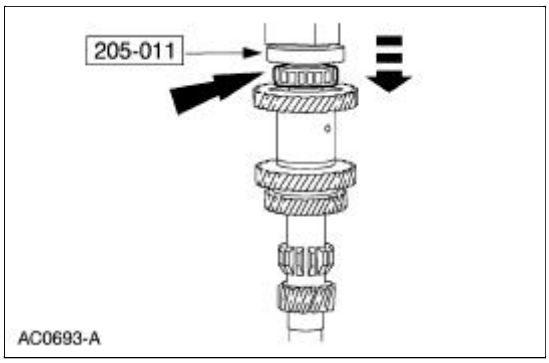
2. Coat the outside diameter of the bearing race with sealer.
   - Use Threadlock and Sealer E0AZ-19554-AA or equivalent meeting Ford specification WSK-M2G351-5A.

3. **CAUTION: Failure to correctly support the case during bearing race installation will result in permanent distortion of the case.**

   Using the special tools and a press, install the bearing race.



4. Using the special tool and a press, install the front countershaft bearing.



Synchronizers

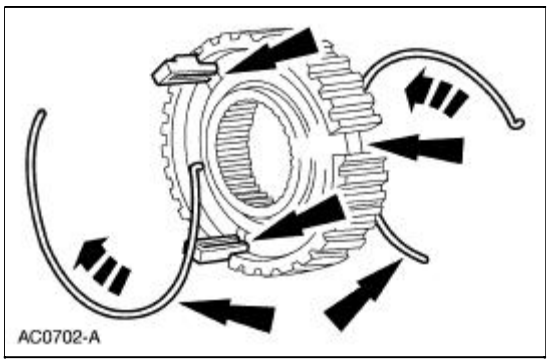
Disassembly

NOTE: This procedure applies to all synchronizer assemblies (7124). The synchronizers are slightly different in design. Notation is made where procedural differences occur.

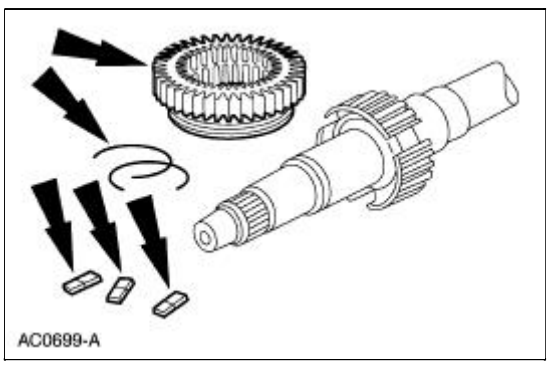
1. On the third/fourth speed synchronizer and the fifth speed synchronizer, scribe an alignment mark on the sliding sleeve and the hub for assembly reference.

2. **NOTE:** Only the synchronizer hub insert springs (7109) and the synchronizer hub inserts (7A044) are available separately.

   Remove the synchronizer hub inserts and the hub insert springs.



3. The first/second speed synchronizer sliding sleeve, the hub, and the output shaft are an assembly. Do not attempt to separate the hub from the output shaft. Discard the entire assembly if wear or damage to the synchronizer or output shaft is evident.



4. On the third/fourth speed synchronizer and the fifth speed synchronizer, remove the sliding sleeve.

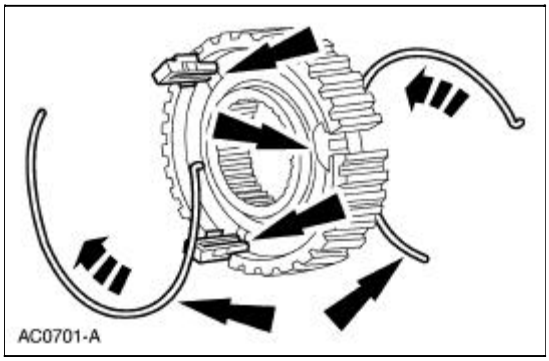
Assembly

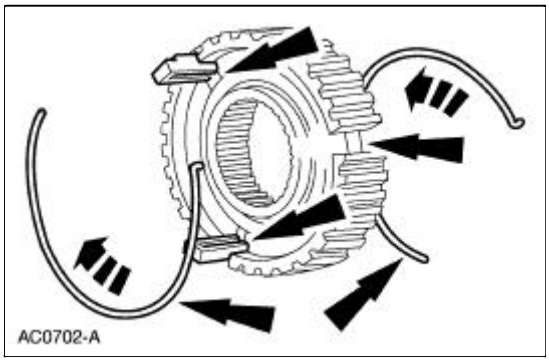
1. **NOTE:** Both synchronizer hub insert springs engage the same synchronizer hub insert but rotate in the opposite direction.

   NOTE: The third/fourth speed synchronizer uses the winged synchronizer hub inserts.

   Install the synchronizer hub inserts and the hub insert springs. Verify that the spring tabs are

positioned over the hub inserts.



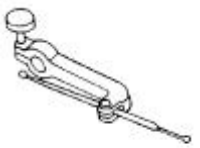
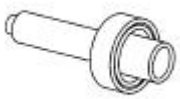
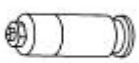


2. **CAUTION: Match the alignment marks made during disassembly. The sleeve and the hub have an extremely close fit. Hold the sleeve and hub square to prevent jamming. Do not force the sleeve onto the hub.**

   On the third/fourth speed synchronizer and the fifth speed synchronizer, install the sliding sleeve.

Transmission

Special Tool(s)

ST1897-A	Dial Indicator with Bracketry 100-002 (TOOL-4201-C) or Equivalent
 ST1348-A	Gauge, Clutch Housing 308-021 (T75L-4201-A)
 ST2199-A	Extension Housing Seal Replacer 308-227 (T94P-7657-A)
ST1186-A	Holding Fixture 307-003 (T57L-500-B)
 ST2147-A	Remover and Replacer Tube 308-052 (T77J-7025-B)
ST2360-A	Torrington Bearing Installer 308-083 (T83P-7025-AH)

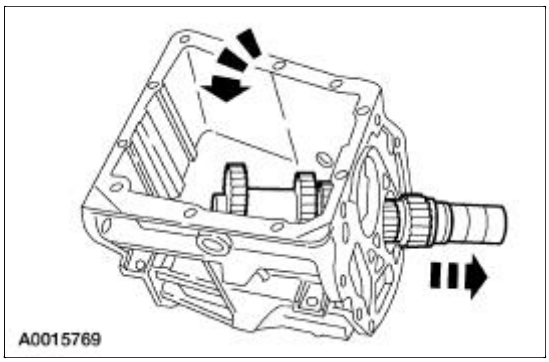
Material

Item	Specification
Motorcraft MERCON® Multi-Purpose (ATF) Transmission Fluid XT-2-QDX	MERCON®
Pipe Sealant with Teflon®	ESR-M18P7-

D8AZ-19554-A	A
Multi-Purpose Grease D0AZ-19554-AA	ESB-M1C93-B
Clear Silicone Rubber D6AZ-19562-AA	ESB-M4G92-A
Motorcraft Premium Long Life Grease XG-1-C	ESA-M1C75-B

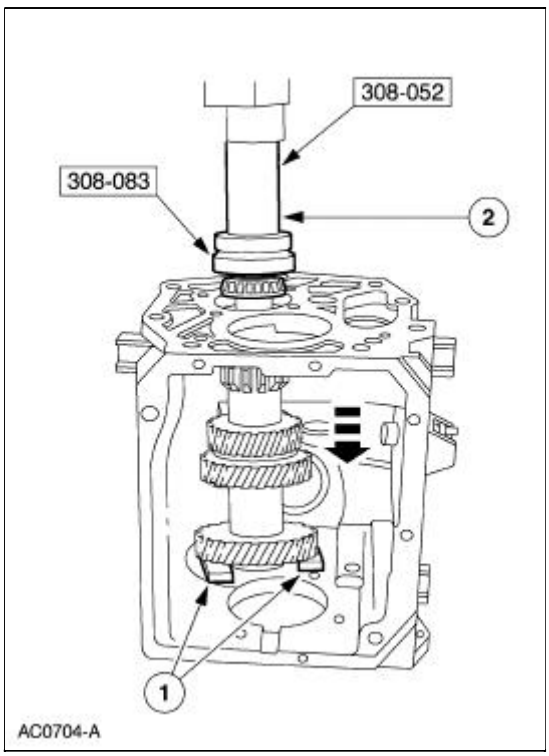
1. Soak the blocking rings in transmission fluid for ten minutes.

2. Position the countershaft cluster gear in the case.

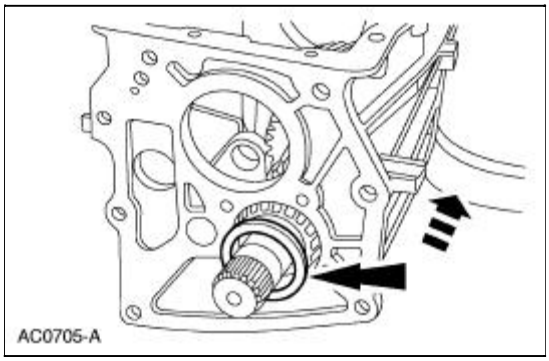


3. **CAUTION: Failure to correctly support the case during bearing installation will result in permanent distortion of the case.**

   Using a the special tools and a press, install the rear countershaft bearing assembly.
   1. Position two 6.35 mm (0.25 in) pieces of bar stock between the countershaft and the case.
   2. Using a the special tools and a press, install the rear countershaft bearing assembly.

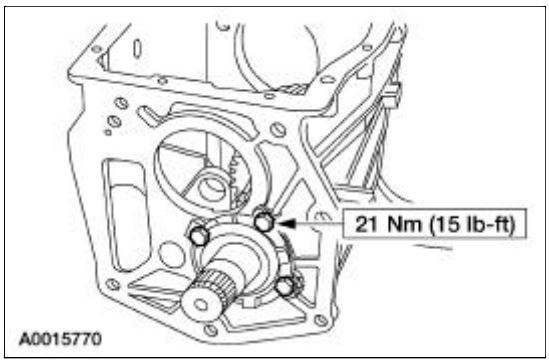


4. Install the rear countershaft bearing race.

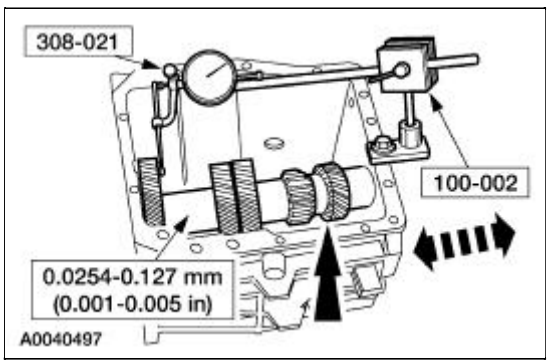


5. **NOTE:** Do not install the shims at this time.

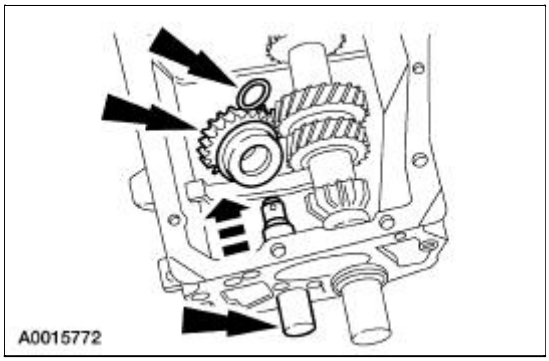
   Install the countershaft rear bearing retainer.



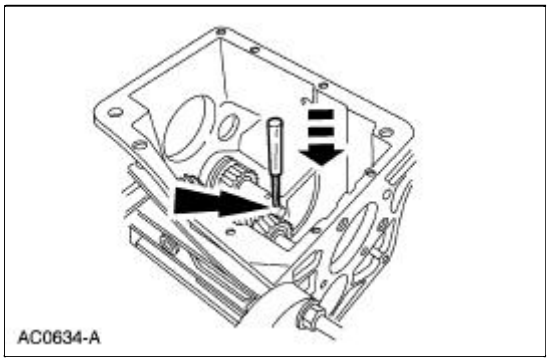
6. Using the special tool, measure the countershaft cluster gear end play.
   - If the end play is not within the specifications, remove the countershaft rear bearing retainer, and install the necessary thickness shim(s). Reinstall the countershaft rear bearing retainer, and recheck the end play.
   - Bend the tabs of the countershaft rear bearing retainer over the bolts when the end play adjustment is complete.



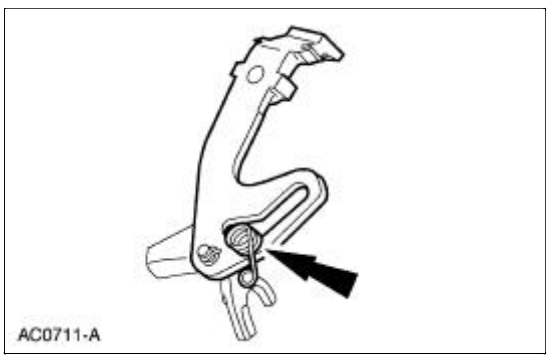
7. Position the reverse idler gear and bushing in the case with the shift lever groove facing the rear of the case. Install the reverse idler gear shaft and the reverse gear overtravel stop.



8. Install the pin.



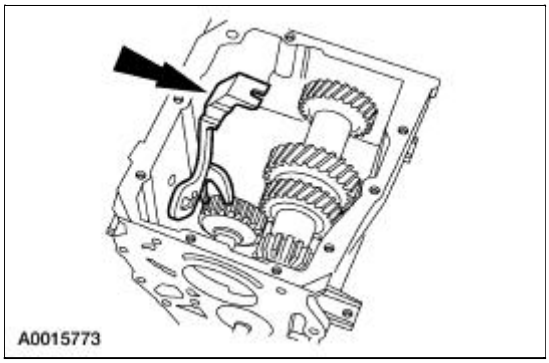
9. Align the reverse gearshift lever, the reverse shift fork, and the reverse positioning spring.



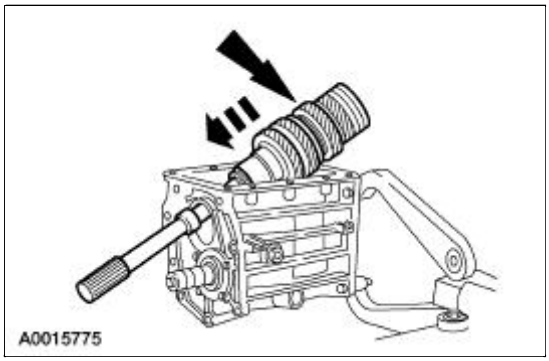
10. **NOTE:** Observe the reverse positioning spring rotation. The spring must rotate counterclockwise into its installed position.

    Install the reverse shift fork.

    - Place the reverse idler gear and bushing into the NEUTRAL position. Align the reverse shift fork and the reverse idler gear and bushing. Push downward on the reverse shift fork until fully engaged into the reverse idler gear and bushing.

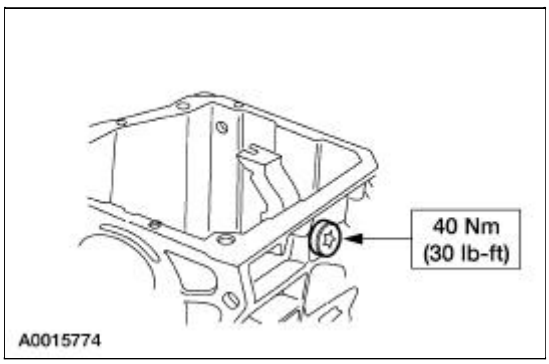


11. Install the output shaft assembly.

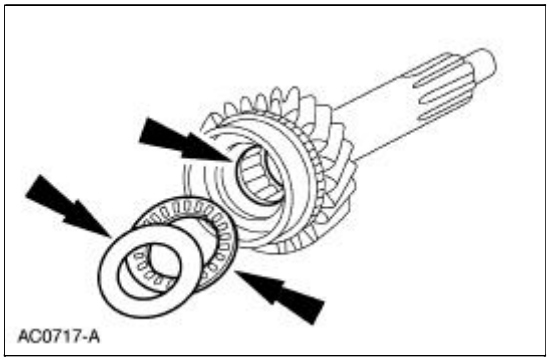


12. **NOTE:** Position the looped end of the reverse positioning spring around the shift lever reverse pin.

    Apply pipe sealant to the shift lever reverse pin threads and install the pin.



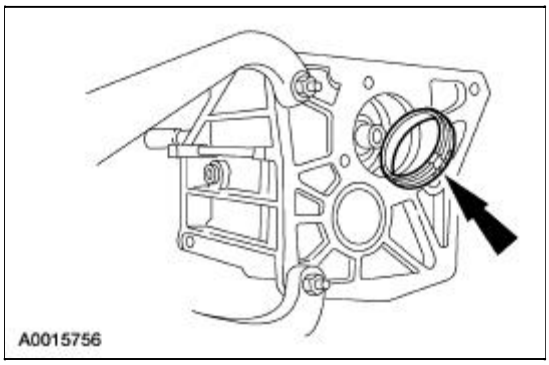
13. Install the roller bearings, the input shaft bearing spacer, the thrust bearing, and the thrust washer.
    - Coat the 15 bearings, the spacer, the thrust bearing, and the thrust washer with grease.



14. **NOTE:** If not done so previously, soak the blocking ring in MERCON® Multi-Purpose ATF Transmission Fluid XT-2-QDX or equivalent for ten minutes.

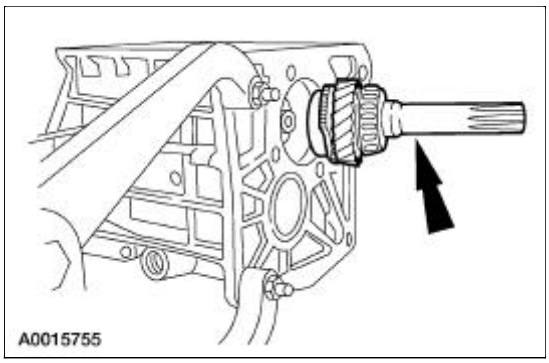
    Install the fourth speed synchronizer blocking ring.

    - Align the notches in the synchronizer blocking ring and the synchronizer hub inserts.



15. **NOTE:** Verify that the fourth speed synchronizer blocking ring is still in position.

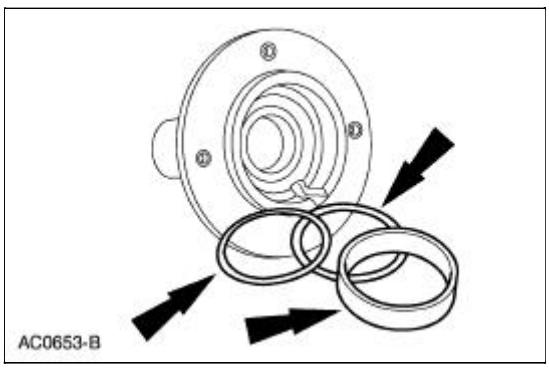
    Align the flat on the fourth gear clutching teeth with the countershaft cluster gear and install the input shaft.



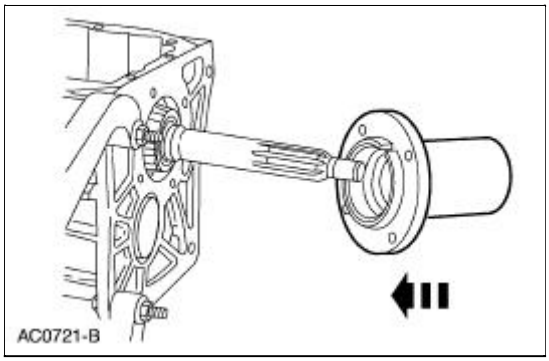
16. **NOTE:** Do not install the end play shims at this time.

    NOTE: Do not apply sealant to the input shaft bearing retainer at this time.

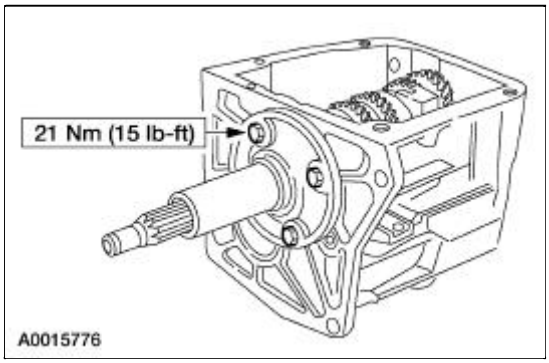
    Install the bearing race in the bearing retainer.



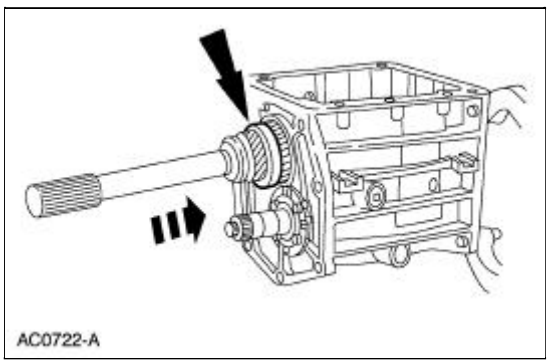
17. Install the input shaft bearing retainer with the notch facing upward.



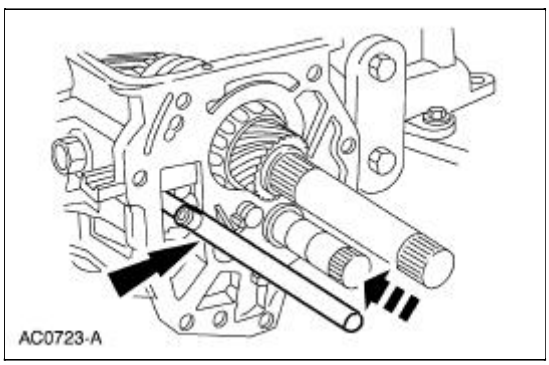
18. Install the bolts.



19. Install the output shaft rear bearing cup.

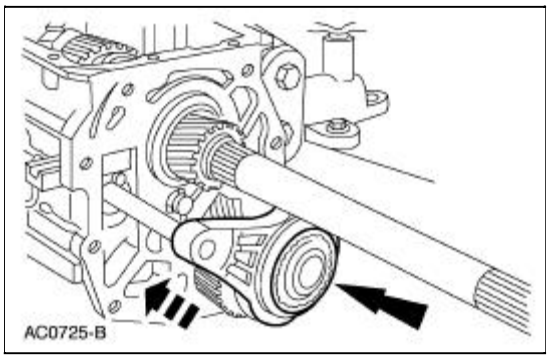


20. Install the reverse gear shift rail.
    - Align the ball stud with the slot in the case and align the reverse gear shift rail with the reverse shift fork. Once the ball stud enters the case, rotate the reverse gear shift rail until the ball aligns with the reverse gearshift lever. Rotate the reverse gear shift rail counterclockwise until the ball stud fully engages the reverse gearshift lever.



21. **NOTE:** If not done so previously, soak the blocking ring in transmission fluid for ten minutes.

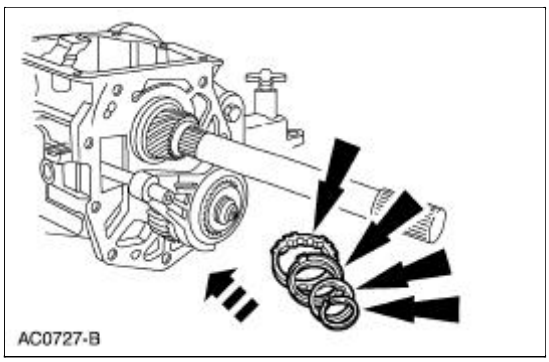
    Install the fifth speed cluster gear, the synchronizer blocking ring, the synchronizer assembly, and the fifth gear shifter fork as an assembly.



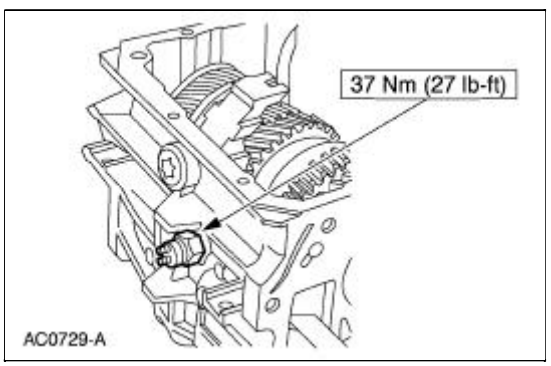
22. **CAUTION: To prevent component damage when installing the extension housing (7A039), the alignment tab on the reverse brake ring (7M000) must engage the alignment slot in the extension housing.**

    NOTE: If not done so previously, soak the blocking ring in transmission fluid for ten minutes.

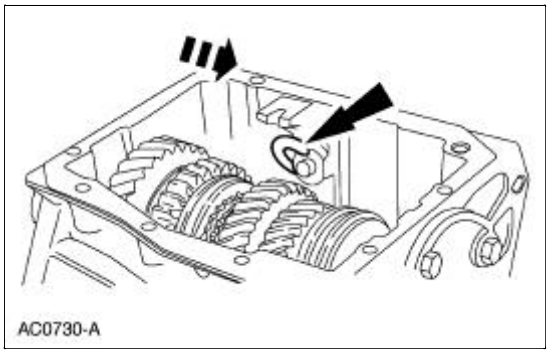
    Install the synchronizer blocking ring, the reverse brake ring, the thrust washer, and the fifth speed synchronizer retaining snap ring.



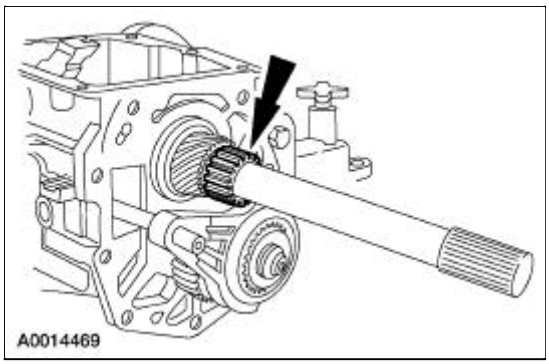
23. Apply pipe sealant to the reversing lamp switch threads and install the switch.



24. Install the reverse gearshift lever retaining clip.



25. Install the output shaft speed wheel and the snap ring.



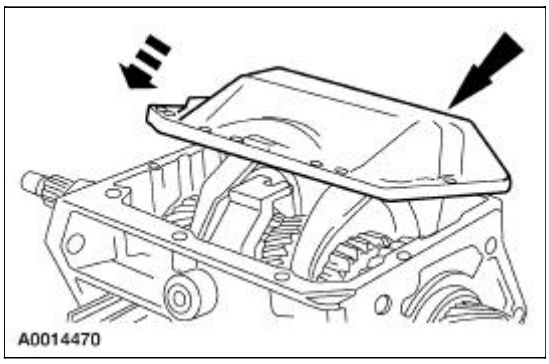
26. **CAUTION: Do not under any circumstance apply silicone sealant to the top of the transmission case. The sealant could fall into the transmission and affect transmission operation.**

    Apply a 3.2-mm (1/8-in) bead of silicone rubber to the sealing surface on the case cover.

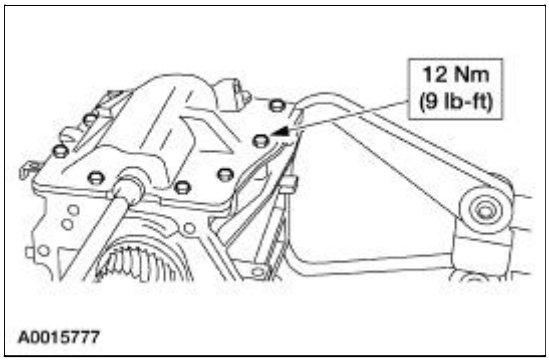
27. **NOTE:** Verify that all of the synchronizers are in the NEUTRAL position and the gear shifter forks in the cover are in the NEUTRAL position.

    Install the case cover.

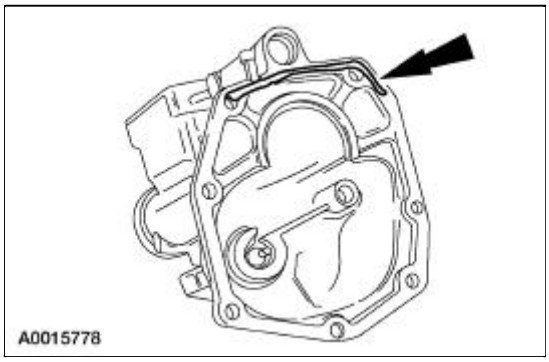
    - Position the cover toward the filler plug side of the transmission and lower it until the gear shifter forks engage the synchronizers. Continue to lower the cover and move it into position to engage the reverse gearshift lever.



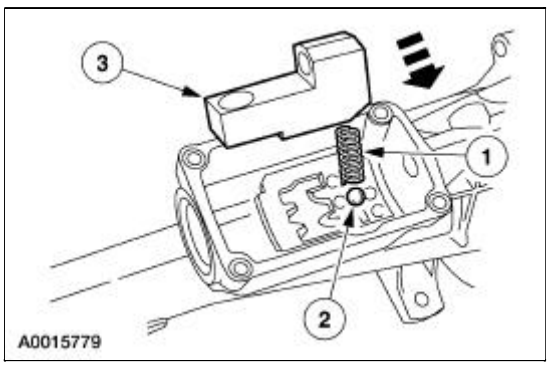
28. Install the bolts.



29. Apply a 3.2-mm (1/8-in) bead of silicone rubber to the sealing surface on the extension housing.



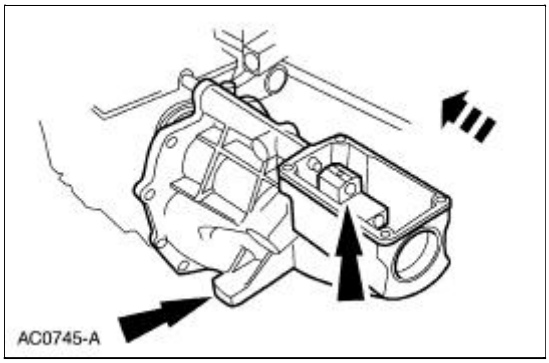
30. Install the detent ball, the shifter detent spring, and the gearshift offset lever.
    1. Coat the shifter detent spring with petroleum jelly and install it in the gearshift offset lever.
    2. Lubricate the detent plate and install the detent ball in the neutral position on the plate.
    3. Position the gearshift offset lever in the extension housing with the gear shift interlock spring over the detent ball.

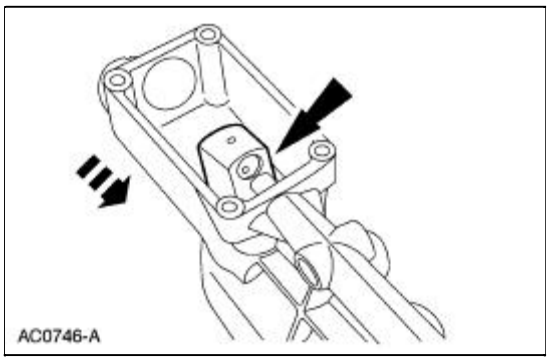


31. **CAUTION: To prevent component damage, the alignment tab on the reverse brake ring must align with the alignment slot in the extension housing.**

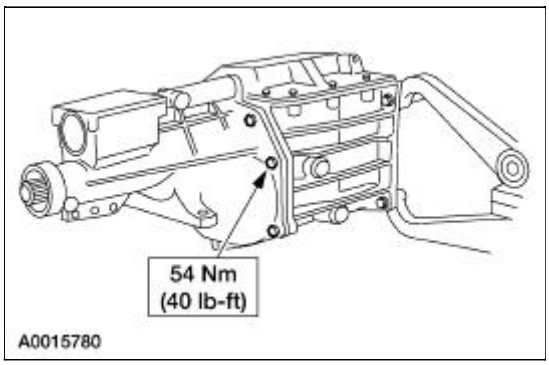
    NOTE: Verify that the oil pick-up funnel engages the fifth gear synchronizer.

    Slide the gearshift offset lever and the extension housing into place as an assembly. Press downward on the gearshift offset lever to compress the shifter interlock spring and push the gearshift offset lever and extension housing into place.

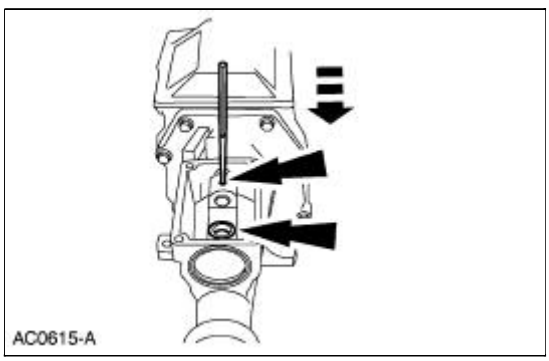




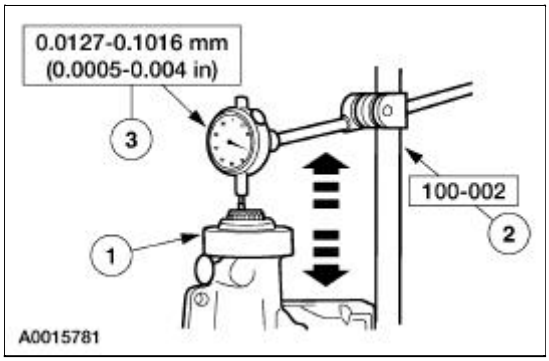
32. Install the identification tag and the bolts.



33. Install the split pin and the gearshift shaft bushing.



34. Using the special tools, measure the output shaft end play.
    1. Place the transmission in a vertical position.
    2. Install the special tool.
    3. Push upward on the input shaft and record the dial indicator reading.

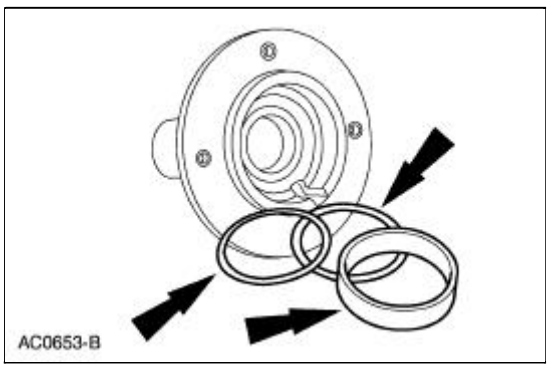


35. **CAUTION: Install the thickest shim closest to the front bearing cup to provide support for the cup.**

CAUTION: Although zero end play is the ideal, end play up to mm (0.002 in) is an acceptable tolerance. Do not overload the bearings with a shim that is too thick as damage may occur.

NOTE: Select a shim with a thickness equal to the dial indicator reading. This will provide zero end play.

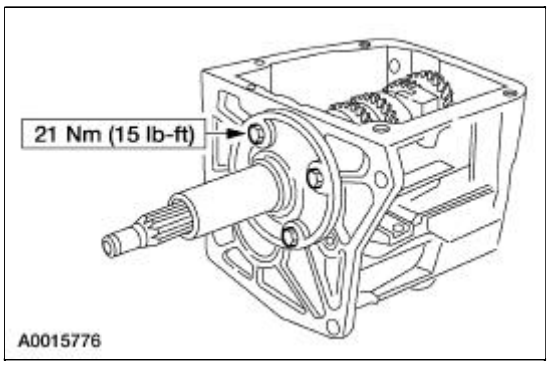
Rotate the transmission to the horizontal position and remove the input shaft bearing retainer. Remove the bearing race and install the necessary shim(s).



36. **CAUTION: Do not cover the notch in the input shaft bearing retainer with sealer.**

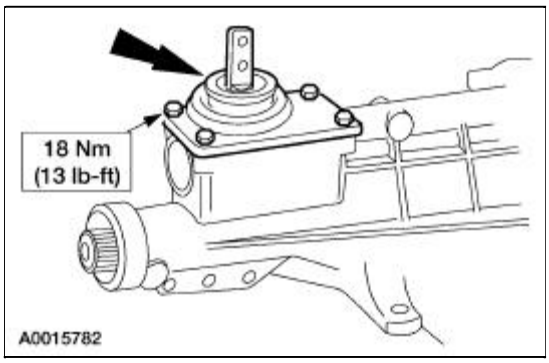
Apply a 3.2-mm (1/8-inch) bead of silicone rubber to the sealing surface on the input shaft bearing retainer.

37. Install the input shaft bearing retainer and the four bolts.

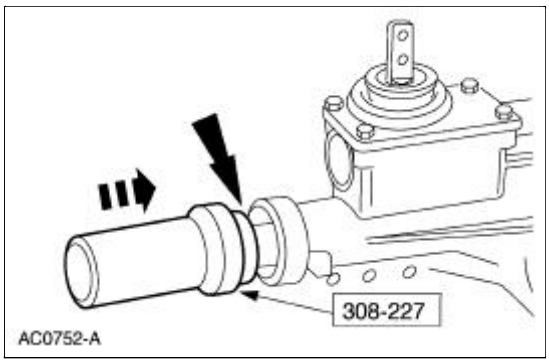


38. Apply a 3.2-mm (1/8-inch) bead of silicone rubber to the sealing surface on the gearshift lever.

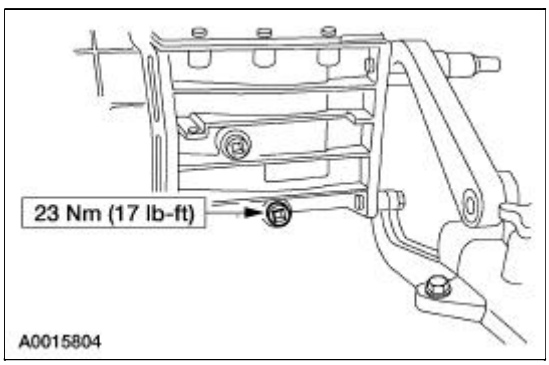
39. Install the gearshift lever.



40. Using the special tool, install the extension housing fluid seal.



41. Install the case plug.



42. **NOTE:** Before installing the transmission, the ball stud, clutch release lever and the input shaft must be cleaned and lubricated with grease.

    Install the clutch release hub and bearing and the clutch release lever. For additional information, refer to Section 308-01 .

Transmission

1. **NOTE:** Before installing the transmission, the ball stud, clutch release lever and the input shaft must be cleaned and lubricated. Use Motorcraft Premium Long-Life Grease XG-1-C or XG-1-K or equivalent meeting Ford specification ESA-M1C75-B.

   To install, reverse the removal procedure. Refer to Transmission in this section.

   - Check, and as necessary, fill the transmission with MERCON® Multi-Purpose ATF Transmission Fluid XT-2-QDX or equivalent. The total fill capacity is 2.6L (2.8 qt).